FEB 9 1929

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THE JOURNAL

OF THE

American Medical Association

Annual Subscription, $5.00 | PUBLISHED WEEKLY | Single Copies, 20 Cents

VOLUME 92, No. 6 | 535 North Dearborn Street, CHICAGO, ILL. | FEBRUARY 9, 1929

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Entered as Second-Class Matter, June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized on June 14, 1918. If undeliverable, return postage is guaranteed

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Bulletin

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The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 92, No. 6 CHICAGO, ILLINOIS FEBRUARY 9, 1929

THE CLINICAL SIGNIFICANCE OF CARDIAC ASTHMA

REVIEW OF TWO HUNDRED AND FIFTY CASES*

ROBERT S. PALMER, M.D.
AND
PAUL D. WHITE, M.D.
BOSTON

Cardiac asthma is a paroxysmal acute dyspnea generally occurring at night but sometimes following exertion, lasting from minutes to hours and accompanied by a sense of suffocation, by wheezing and often by cough with frothy sputum, which may or may not be bloody, and which is due fundamentally to serious heart disease, especially involving the left ventricle. The attack is characteristically relieved by the upright position and by morphine. On physical examination, wheezing respiration and sometimes bubbling râles are observed. A synonym occasionally used for the more severe cases is acute suffocative pulmonary edema. The term cardiac asthma is much more suitable for this condition than is paroxysmal dyspnea alone, which is far less descriptive and which may include other conditions, such as Cheyne-Stokes respiration. The word asthma is derived from the Greek ἄσθμα (ἀσθμαίνω) meaning short drawn breath, panting. The word was used in ancient times in a phrase indicating gasping for breath, as in one dying.[1]

We have reviewed 250 cases of cardiac asthma, 125 from private practice and 125 from hospital practice, in order to estimate more accurately the prognosis, to examine the effect of treatment, and to clarify, if possible, clinical and etiologic types. All except eight of the 250 cases have been followed to date or to death of the patient.

REVIEW OF THE LITERATURE

The English physician James Hope[2] first used the term cardiac asthma in 1833. Stokes,[3] in 1854, also used the term and discussed the condition at some length, advocating mercury in its treatment. The name cardiac asthma for many years has been generally used in the German literature (Fraenkel[4] and Fraentzel[5]). It is also common in current French literature, though Huchard,[6] who held the toxic theory of causation, referred to this phenomenon as acute pulmonary edema.

Cardiac asthma in recent years has been discussed briefly in Mackenzie's textbooks[7] and more fully in those of Vaquez[8] and Romberg.[9] An interesting note by Mackenzie is that Dr. Samuel Johnson, attended by Heberden, suffered from cardiac asthma for two years before his death at the age of 75. The great man's only relief was from tincture of opium. Romberg's[9] theory of the initial inciting cause of an attack is that, with the coronary circulation narrowed by sclerosis, the blood pressure falls during sleep and becomes too low to force sufficient blood through the narrow coronary arteries. The result of this partial occlusion of the blood supply to the ventricular muscle is acute failure and cardiac asthma.

Longcope[10] ascribes the cause of the paroxysms to a possible aortic reflex, as does Wassermann,[11] who names it the "cardio-aortic-bulbar pulmonary reflex phenomenon." In 1926, Pratt[12] reviewed the literature and analyzed a series of thirty-nine cases observed by him. Eppinger, von Papp and Schwarz,[13] after a study of the circulation rate, reported that they found it raised during a paroxysm of cardiac asthma, while after recovery under morphine it was lowered. Kahn[14] differentiates two forms of cardiac asthma: first, "pulmonary asthma" associated with right ventricular deficiency and pulmonary stasis, and, second, "paroxysmal cardiac dyspnea" depending on left ventricular failure producing irritability of the respiratory center and reflex attacks of paroxysmal dyspnea. Kahn believes that the two forms may coexist. Von Korányi[15] believes that left ventricular failure, the result of shifts in body fluids from transudates or edema, is the inciting cause. Such a shift is likely to occur in the recumbent position, thus explaining the nocturnal onset.

Fraser[16] argues that increased respiratory effort in the presence of mechanical difficulties or in response to stimulation from the respiratory center causes an increased blood flow. The right ventricle responds

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* Read before the Association of American Physicians, Washington, D. C., May 1, 1928.

* From the Electrocardiographic Laboratory and Cardiac Clinic of the Massachusetts General Hospital.

1. Liddell-Scott: Greek-English Lexicon, revised edition, New York, Harper & Brothers, 1883.
2. Hope, James: A Treatise on Diseases of the Heart and Great Vessels, ed. 1, London, 1833, p. 345.
3. Stokes, W.: The Diseases of the Heart and the Aorta, Dublin, Hodges & Smith, 1854.
4. Fraenkel, A.: Ueber die klinischen Erscheinungen der Arteriosclerose und ihre Behändlung, Ztschr. f. klin. Med. **4**: 1, 1882.
5. Fraentzel, O.: Krankheiten des Herzens, Berlin, A. Hirschwald, 1889, p. 90.
6. Huchard, M. H.: L'oedème aigu du poumon, Bull. Acad. de méd. **37**: 492, 1897.
7. Mackenzie, J.: Diseases of the Heart, ed. 4, Humphrey Milford, London, Oxford University Press, 1925; Angina Pectoris, London, Henry Froude and Hodder & Stoughton, 1923.
8. Vaquez, H.: Diseases of the Heart, translated by G. F. Laidlaw, Philadelphia, W. B. Saunders Company, 1924, p. 634.
9. Romberg, E. L.: Lehrbuch der Krankheiten des Herzens und der Blutgefässe, Stuttgart, Ferdinand Enke, 1925, pp. 142, 486.
10. Longcope, W. T.: Syphilitic Aortitis: Its Diagnosis and Treatment, Arch. Int. Med. **11**: 15 (Jan.) 1913.
11. Wassermann, S.: Zur Pathogenese des akuten Herzlungenödems, Wien. klin. Wchnschr. **41**: 190 (Feb. 9) 1928.
12. Pratt, J. H.: Cardiac Asthma, J. A. M. A. **87**: 809 (Sept. 11) 1926.
13. Eppinger, H.; von Papp, L., and Schwarz, H.: Ueber das Asthma cardiale, Berlin, 1924.
14. Kahn, M. H.: Cardiac Asthma, Am. Heart J. **2**: 424, 1927.
15. Von Korányi, A.: Ueber einige Fragen der Pathogenese und der Therapie des Asthma cardiale, Jahresk. f. ärztl. Fortbild. **18**: 1 (Feb.) 1927.
16. Fraser, F. R.: Cardiac Dyspnea, Third Goulstonian Lecture, Lancet **1**: 643, 1927.

more vigorously than the left, increasing the blood flow through the pulmonary circuit. This increased blood flow is too great to be taken care of by the left ventricle, already at the limit of its reserve. This lack of balance between the two sides of the heart results in pulmonary edema. Relief by morphine, according to this theory, is by depression of the respiratory center, which abolishes the stimulus to increased blood flow, thus allowing the left ventricle to recover. It has been noted that oxygen saturation is above normal during a paroxysm and well below normal after relief by morphine.

Harkavy [17] analyzed four cases in which there was a history of asthmatic attacks, all with associated cardiovascular abnormalities, but in none of these were the attacks cardiac in origin, as shown by the history, skin tests, desensitization and freedom from attacks, and, in one case, by the cessation of attacks following termination of the pollen season.

A variety of drugs have been used in the treatment of cardiac asthma, though almost all are agreed on the efficacy of morphine for the relief of acute attacks. Brunn,[18] Singer [19] and Eppinger, von Papp and Schwarz [13] have found solution of pituitary effective early in an attack. Singer has used strophanthin intravenously with success in the relief of paroxysms.

For a general regimen, most writers recommend digitalization, reduction of fluids and at times diuretics. Nitrites are thought to be of some use. Morphine may be depended on in acute attacks, and by some its use prophylactically is recommended. Venesection may be necessary and has been stated to have been effective in acute attacks.

Danzer [20] produced peripheral stasis by compression of the four limbs with blood pressure cuffs for from ten to twelve minutes, with definite relief of cardiac asthma in five minutes. This procedure was assumed to have relieved the load on the heart sufficiently for recovery to take place.

STATISTICS

Our 250 cases were found in a group of 3,100 cases of organic heart disease, an incidence of 8 per cent. When we divided the series of cases reviewed and the cases of cardiac asthma found into etiologic groups, a large percentage, and the largest actual number of cases of cardiac asthma, were found among the arteriosclerotic-hypertensive types; there were 187 cases among 1,737 cases of this type reviewed, or 10.7 per cent, as compared with 2.2 per cent of the rheumatic type, seventeen cases having been found among 768 cases reviewed. In the 161 cases of syphilitic heart disease, thirty-four cases of cardiac asthma were found, giving the highest relative incidence of all; namely, a percentage of 21. Of the patients suffering from chronic nephritis, 19 per cent had cardiac asthma, or twenty-nine of the group of 153 reviewed. Further subdivision of one group of 1,838 cases of organic heart disease from private practice, among which 125 cases of cardiac asthma were found, revealed a relatively smaller number among "pure hypertensive" cases (eleven of 251 cases reviewed, or 4.3 per cent) than among "pure arteriosclerotic" cases (thirty-seven of 485 cases reviewed, or 7.63 per cent). Again, considering the series as a whole, including both private practice and hospital groups, we found that the incidence of cardiac asthma in patients with coronary occlusion was 13.2 per cent; that is, twenty-five cases were found in a review of 181 cases of coronary occlusion. A not infrequent sequence in our experience has been the occurrence of coronary occlusion followed, in some of the survivors, by more or less chronic congestive failure of variable degree, punctuated by attacks of cardiac asthma. More than 9 per cent of the patients with angina pectoris had cardiac asthma as well, there being forty-three cases among 459 cases of angina pectoris reviewed. In one of our cases the attacks of angina pectoris gradually assumed a more and more important rôle, with the progress of the disease toward death.

Our figures indicate the infrequent combination of auricular fibrillation and cardiac asthma, only eleven such cases having been found in 350 cases from private practice, or 3.1 per cent. Cardiac asthma did not appear in any of the thirty-four cases of subacute bacterial endocarditis; in any of the thirty-eight cases of congenital heart disease; in any of the twenty-six cases of thyroid heart disease, or in any of the sixteen cases of the "emphysema heart" of the private practice group. Twelve cases of cardiac asthma were found in patients whose heart disease was of uncertain etiology.

When the 250 patients with cardiac asthma were divided into groups according to the diagnosis and whether living or dead, and according to the length of survival to death or to the time of the last report, we found that cardiac asthma in syphilitic heart disease indicates an early and fatal outcome, sharing and confirming, as it were, the grave prognosis of syphilitic aortitis itself. Of the thirty patients with uncomplicated syphilitic heart disease, twenty-six are dead, eleven having died within six months or less after the onset of the cardiac asthma and eleven within six months to two years after the onset. The same may be said of coronary thrombosis with cardiac asthma. Of the twenty-five patients with definite coronary occlusion, twenty-one have died, eleven within six months of the onset and seven within from six months to two years of the onset. Thirty-one of forty-three patients with angina pectoris died, ten within six months of the onset and eleven within from six months to two years; ten lived more than two years after the onset. In the arteriosclerotic and hypertensive group, in which most of the cases are found, cardiac asthma appears to be consistent with a longer life.

Considering the series as a whole, 170 patients have died, fifty-nine within six months after the onset of the cardiac asthma; sixty-nine within two years, and forty-two after surviving for more than two years. Of the eighty living patients in the whole series, twenty-three are known to be living six months or less after the onset of cardiac asthma; thirty-two are living from six months to two years after the onset, and twenty-five are living more than two years after the onset.

Like coronary occlusion, cardiac asthma is much more common among males (180 males, 70 females), and in our series the mortality among males is also much greater (132 dead, forty-eight living among males; thirty-eight dead, thirty-two living among females).

Cardiac asthma is found chiefly in the sixth decade of life; there were 102 such cases in our series. It has occurred as early as 18 years of age, the youngest

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18. Brunn, F.: Beiträge zur Frage der Genese und Therapie des Asthma cardiale, Med. Klin. **22**: 1102 (July 16) 1926; Ueber die Kombination von Asthma cardiale mit Angina Pectoris, Wien klin. Wchnschr. **40**: 1277 (Oct. 13) 1927.

19. Singer, R.: Ueber Asthma cardiale: I. Pathogenese, Symptomatologie, Differentialdiagnose, Wien klin. Wchnschr. **40**: 562, 1927; Ueber Asthma cardiale: II. Therapie, ibid. **40**: 594 (May 5) 1927.

20. Danzer, C. S.: Effect of Venostasis on Heart Failure with Particular Reference to Cardiac Asthma, Proc. Soc. Exper. Biol. & Med. **24**: 588 (March) 1927.

patient of the entire series. The oldest patient was 80 years of age. The age at which it occurs does not give an undoubted indication of the prognosis, except that the proportion of those dead is greater at the older ages. There were two patients in the third decade. One died within six months and one lived more than six months after the onset of cardiac asthma. There were eleven patients in the fourth decade, four having died within six months, six having survived six months or longer.[21] There were thirty-seven patients in the fifth decade; eight died within six months, and twenty-four survived longer than six months. Of the 102 patients in the sixth decade, twenty-three died within six months and sixty-eight lived more than six months. There were sixty-six patients in the seventh decade, seventeen having died within six months and forty-five having survived longer than this. Of thirty-one in the eighth decade of life, six died within six months and twenty-three lived longer than six months.

The duration from the onset of cardiac symptoms to the onset of cardiac asthma is not significant from the prognostic point of view.

The average duration of life in the 170 patients of this series who have died has been 1.4 years, and the duration of life of those still living is 1.65 years. The longest duration among those living is fifteen years and ten months, and the longest duration among those dead is fifteen years and four months. Both of these cases are of unusually long duration, surpassing most of the other cases by a good many years. They may be compared to the occasional cases of coronary thrombosis, in which the patients survive for many years.

On dividing the cases according to the frequency of attacks, we found that in those cases in which attacks occurred with great frequency, that is, more than once a day, the expectation of an early death is definitely increased, thirty-nine of sixty-one patients having died, twenty-three within six months. The same is true of duration and severity; that is, unless the attacks on occasion have been very long or very severe, the prognosis has not been affected. The symptoms and signs of well marked congestive failure have been of some prognostic significance (present in 64 per cent of those dead within six months and in 46 per cent of those living more than six months).

The commonest valve lesion found was aortic regurgitation (sixty-three patients). Of this number forty-nine have died. A considerable proportion of these were syphilitic. Only eleven cases of mitral stenosis occurred in the entire series. Especial significance was found in heart size in that only six of the entire 250 cases failed to show definite cardiac enlargement. Poor heart sounds appeared to alter the prognosis somewhat for the worse.

In those cases showing gallop rhythm and in those showing pulsus alternans, the prognosis is graver, especially in pulsus alternans. Thirty-one patients showed pulsus alternans. Twenty-eight of these are dead and three are living. Twenty-one died within two years, and ten of these died within six months. Of those patients that died within six months, 28.8 per cent showed gallop rhythm, while 20.2 per cent of those who survived six months or longer showed this abnormality.

Of the electrocardiographic observations, intraventricular and auriculoventricular block appeared to enhance somewhat the seriousness of cardiac asthma. There were twenty-nine patients with intraventricular block; twenty-three are dead and six are living. Four of this group died within six months, and thirteen from six months to two years after the onset of the cardiac asthma. Of thirteen patients showing partial auriculoventricular block, twelve are dead and one is living. Inversion of the T wave and low voltage in the electrocardiogram were not important prognostic signs in the entire group of cases of cardiac asthma. Altogether, 156 of the 250 patients were examined by means of the electrocardiograph. Eight of these showed low voltage and thirty-eight inverted T waves in lead I or lead II.

In regard to treatment, our experience has been in accord with that of others. Morphine in cardiac asthma is almost specific. When its use was uncomplicated by other therapy, it failed to relieve only once in fifty-eight instances. If a patient in middle life or over who suffers from paroxysmal attacks of dyspnea is not relieved by morphine, allergic asthma is likely. Conversely, if epinephrine gives only slight or no relief, the diagnosis of cardiac asthma is greatly favored. Allergic and cardiac asthma coexisted in five of our cases, and in one of these it was demonstrated very clearly that epinephrine relieved one type of paroxysmal dyspnea (allergic) while later it was found ineffective in the second type of dyspnea (cardiac asthma). We have seen epinephrine afford some measure of relief on three occasions in undoubted cases of cardiac asthma.

Nitrites, when their effect was uncomplicated by the use of other remedies, gave some relief thirty-seven times and no relief twenty-eight times. Alcohol was used by fourteen patients as a first aid measure. Relief of varying degree was reported by twelve. A general regimen, including rest, digitalis especially, diet, limitation of fluids, and morphine or nitrites for acute attacks, afforded temporary to marked relief in 132 cases, while no improvement could be noted in thirty-three.

We are convinced that judicious management is of primary importance in the treatment of cardiac asthma.

Digitalis, in contrast to its doubtful value in angina pectoris, is very effective in the general treatment of patients suffering from cardiac asthma. The fluid intake must be somewhat guarded. The value of this measure was seen in one of the patients at the time of a prostatectomy. Fluids were forced in the usual manner but they precipitated attacks of cardiac asthma, which were relieved when fluids were again reduced and digitalis was given. Occasionally an anomalous situation will arise in which cardiac asthma will improve or even entirely disappear with the onset and progress of congestive failure. At first the situation may seem to be better, but the last state of such a patient will be worse than the first and the congestive failure will need to be treated; with loss of edema and general improvement attacks of cardiac asthma may return. Finally, care must be exercised in advising procedures ordinarily harmless. We have seen the death of one patient who was in fair condition brought on by the strain incident to the extraction of teeth.

A number of additional facts emerged from our study. A few cases in nervous persons appeared to last longer than others, and it was felt that patients with low sensory threshold might exhibit cardiac asthma sooner than others. This did not prove to be the case in those now dead. The average duration of life thus far in those living who are of the nervous type is slightly longer than for the group as a whole.

The incidence of eosinophilia was tabulated in 119 cases, sixty-seven showing no eosinophilia, thirty-seven

21. Discrepancies noted in the figures here and to follow in this paragraph are explained by the fact that some of the patients are still alive but at an interval less than six months after the onset of the cardiac asthma.

showing 1 per cent, nine 2 per cent, three 3 per cent, and three 4 per cent. One patient, a Greek, who also had an enlarged spleen, showed a 7 per cent eosinophilia. Bronchial asthma in him was definitely excluded.

In the present series of 250 cases of cardiac asthma, cardiac enlargement and coronary disease were the most frequent observations in those examined at autopsy. Because of the large number of patients in our series dying at a distance outside the hospital, we have data on only thirteen patients examined at autopsy. Of these, two showed thrombosis of the descending branch of the left coronary artery and two showed marked sclerosis of the same artery. Six others showed some degree of sclerosis in one or both coronaries. There was definite evidence of pericarditis in five, one tuberculous, two fibrinous and two showing definite adhesions. One patient died some months after having been seen by us and at autopsy showed an acute general miliary tuberculosis and tuberculous pericarditis. The heart weight in these thirteen cases varied from 320 to 935 Gm.

MECHANISM OF CARDIAC ASTHMA

The facts on which we base our idea of the mechanism of cardiac asthma in the present group of cases may be summarized as follows:

1. There was a serious strain on the heart either from an intrinsic cause, such as coronary disease or aortic regurgitation, or from an extrinsic cause, such as hypertension, or not rarely from intrinsic and extrinsic factors combined.

2. Almost invariably the left ventricle was the chamber particularly involved.

3. Other symptoms and signs of heart failure or limited reserve, especially of the left ventricle, were frequent.

4. The attacks came almost invariably in the dead of night when the patient was asleep in the recumbent position, or on or after exertion, when in each instance the blood flow was increased, giving extra work for the heart.

5. The attacks lasted usually more than half an hour, until relief came by the assumption of the upright position with or without further help from morphine. They were rarely transient, as in angina pectoris, and rarely relieved so dramatically by nitrites.

6. The variation in duration depended on the severity of the attack, very mild spells lasting only a few minutes while very severe spells lasted for hours. The attacks were often associated with coughing up of blood and usually occurred in the sickest patients, sometimes terminating in death.

7. Digitalization and rest generally prevented the attacks for a while at least, or greatly reduced their frequency and severity.

These facts suggest that left ventricular strain and failure cause, with increased blood flow, a stasis of blood in the pulmonary circulation, the right ventricle sending on too much blood for the left ventricle to take care of. Gradually this accumulation of blood in the pulmonary circuit increases, until by reflex stimulation the attack of asthmatic breathing is induced and the patient is awakened. By assuming the upright position, the stasis and also the strain on the left ventricle are reduced and recovery takes place. Morphine doubtless helps by reducing the irritability of the respiratory and other nerve centers, allowing the nervous part of the process to subside, perhaps a bit ahead of the circulatory stasis, and thus aiding the circulation by relieving the nervous strain. A primary cerebral or coronary mechanism appears less likely than that just described.

SUMMARY

In a group of 250 patients with cardiac asthma discovered in the past few years among 3,100 private and hospital patients with organic heart disease (8 per cent), 180 were males and seventy females, and all but fourteen were over 40 years of age. The grave prognostic significance of the condition is shown by the fact that 170 of the 250 patients are known to have died, with an average duration of life of 1.4 years after the first attack of cardiac asthma. The largest number of cases, 187, was found in the group of patients with coronary disease, hypertension, or both (10.7 per cent of this etiologic group), but the highest relative incidence occurred in syphilitic heart disease (21 per cent) and in chronic nephritis (19 per cent). Left ventricular failure due to any one or a combination of several factors appears responsible for cardiac asthma, but the exact mechanism is not clear. The frequency, duration and severity of the attacks altered the prognosis appreciably only when of extreme degree. The coincidence of poor heart sounds, gallop rhythm and pulsus alternans indicated, as a rule, a very short life. Aortic regurgitation, usually of syphilitic origin, was the only common valve defect (sixty-three cases of the 250). In therapy, digitalis and rest were generally effective in reducing the number of attacks and apparently in prolonging life; for the treatment of the acute attacks nitrites and alcohol were sometimes helpful, but morphine was of the greatest value.

HYPERVENTILATION OF THE LUNGS AS A PROPHYLACTIC MEASURE FOR PNEUMONIA*

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Prior to the introduction of the treatment now prevalent for carbon monoxide asphyxia by means of inhalation of carbon dioxide and oxygen,[1] pneumonia was one of the recognized sequels of severe but not immediately fatal gassing.[2] It is therefore a suggestive fact that, among cases treated by inhalation of carbon dioxide, postasphyxial pneumonia does not occur. Among hundreds of cases thus treated, of which we have records, there is not a single report of a subsequent pneumonia.

In this laboratory a few years ago it was found also, as previously observed by Oliver,[3] that dogs after prolonged asphyxia may develop a condition of acute congestion of the lungs. Against this condition in dogs, inhalation of carbon dioxide in oxygen is an effective prophylaxis.

These facts, when they first came to our attention, were both unforeseen and unexplainable. Little stress was laid on them in the publications from this laboratory at that time; for other evidence demonstrates beyond question that carbon monoxide is not a pulmonary irritant. Any suggestion that it injures the lungs directly would have tended to impede the intro-

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1. Henderson, Yandell; and Haggard, H. W.: The Treatment of Carbon Monoxide Asphyxia by Means of Oxygen plus CO_2 Inhalation, J. A. M. A. **79**: 1137 (Sept. 30) 1922. Henderson, Yandell: Resuscitation from Carbon Monoxide Asphyxia from Ether or Alcohol Intoxication, and from Respiratory Failure Due to Other Causes, ibid. **83**: 758 (Sept. 6) 1924.

2. Glaister, J., and Logan, D.: Gas Poisoning in Mining and Other Industries, Edinburgh, 1914, pp. 104-117.

3. Oliver, quoted from Glaister and Logan (footnote 2), p. 113.

duction of the treatment by inhalation of carbon dioxide; for it would have confused the clinical picture of carbon monoxide poisoning with that of such irritant gases as are used in war.[4]

At about the same time that this treatment for asphyxia was introduced, we introduced also inhalation of carbon dioxide in surgical anesthesia.[5] The purpose of such inhalation at the termination of anesthesia is the same as in carbon monoxide asphyxia; namely, to increase the ventilation of the lungs and thus to hasten the elimination of the anesthetic after anesthesia, as of carbon monoxide after asphyxia. Beyond this point our insight did not extend. Up to the present time, therefore, we have taken an attitude of extreme caution toward the use of carbon dioxide inhalation in connection with pneumonia. We have, however, kept this matter in mind as a possible development, for we receive a large number of reports regarding the use of carbon dioxide inhalation in asphyxia and related conditions, and among these reports from time to time there have been a number telling of the use of the inhalation of 5 per cent carbon dioxide in oxygen in cases of pneumonia. These reports have stated that inhalation of this mixture of gases induces deeper breathing and seems more beneficial than inhalation of oxygen alone. But until recently the causal relation of asphyxia to pulmonary congestion, and the nature of the preventive influence of inhalation of carbon dioxide, have been completely beyond knowledge and even beyond guess.

Recent developments and the observations of other investigators seem now to indicate that the condition which serves as the link between asphyxia and the development of pneumonia in untreated cases of carbon monoxide poisoning is the depression of breathing during profound asphyxia. During depressed respiration, and particularly in shallow breathing, considerable areas of the lungs remain unventilated. The bronchioles leading to such unventilated areas may become occluded by the accumulating secretions from their walls. The air within the alveoli is then gradually absorbed; for, as Jackson and Lee[6] have shown clinically, whenever an air tube is occluded atelectasis develops in the area which that tube supplies. Experimentally, Coryllos and Birnbaum[7] find that even in an otherwise normal lung the gaseous contents of any occluded area are absorbed and the condition of atelectasis or massive collapse develops. Thus any area which is not from time to time distended with air tends to become atelectatic. Elwyn[8] holds that postoperative pneumonia generally arises in atelectatic areas of the lungs, a view which Coryllos and Birnbaum extend to all true pneumonias by showing that pneumococcal infection always induces atelectasis.

Observations reported recently by Scott and Cutler[9] are especially significant. They not only indicate that the pulmonary complications, particularly atelectasis, following major surgical operations under general anesthesia develop in this way; they demonstrate also how atelectasis may be prevented. These investigators find that the deep breathing, or hyperventilation, which is induced by inhalation of carbon dioxide distends the lungs so effectively that postanesthetic atelectasis is avoided or counteracted. They explain the development of atelectasis after anesthesia as the result of occlusion of air tubes, perhaps through a nervous reflex. The air is then absorbed from such unventilated portions of the lungs. They demonstrate that hyperventilation induced by inhalation of carbon dioxide, by expanding these occluded and collapsing portions of the lungs, is an effective preventive of atelectasis. Confirmation of these observations is reported by Sise, Mason and Bogan.[10]

Similar observations have been made in German clinics[11] in which the inhalation of carbon dioxide has been introduced recently from the American literature of this subject. As a result, in many surgical clinics in both Germany and America now, a short period of hyperventilation by means of inhalation of carbon dioxide at the termination of general anesthesia has been adopted as a routine measure for the expansion of the lungs, the prevention of atelectasis, and thus for the elimination of the risk of pneumonia.

The question thus naturally arises whether this measure for distending unventilated portions of the lungs may not have a prophylactic value in relation to the ordinary forms of pneumonia. Obviously, the answer to this question turns on whether or not atelectasis is a factor in the development and spread of infection in the lungs following influenza and other precursors of pneumonia.

Among pathologists and among physicians whose conceptions of pneumonia are largely based on observations of the terminal conditions as revealed at autopsy, a sharp distinction is usually drawn between the pneumonic condition and the atelectatic condition. They fail to realize that pneumonia has a physiology as well as a pathology. It is coming to be recognized that in the development of every true pneumonia there is the factor of atelectasis. Experimental data which go far to establish this relation have been obtained by Coryllos and Birnbaum.[12] Their recent work, which has just been reported and which we have been privileged to see prior to publication, shows that, when pneumonia is induced in dogs, atelectasis is always a factor. They find that the causal sequence is essentially as follows: (1) Infection of the walls of the air tubes produces an excessive and sticky secretion; (2) occlusion of an air tube by this secretion shuts off the portion of the lung to which it leads—it may be only a lobe or an entire lung; (3) as the air is absorbed atelectasis develops, and (4) secretions accumulate back of the occlusion and consolidation follows.

The point to which attention is to be specially directed here is that, if this sequence is correct, the prevention or relief of atelectasis by deep breathing produced by inhalation of carbon dioxide will tend to limit the area involved in the development of pneumonia. For, as

4. Henderson, Yandell; and Haggard, H. W.: Noxious Gases and the Principles of Respiration Influencing Their Action, Chemical Catalog Company, 1927, pp. 113-124.

5. Henderson, Yandell; Haggard, H. W., and Coburn, R. C.: Administration of Carbon Dioxide After Anesthesia and Operation, J. A. M. A. **76**: 672 (March 5) 1921; The Acapnia Theory, Now, ibid. **77**: 424 (Aug. 6) 1921.

6. Jackson, Chevalier; and Lee, W. E.: Acute Massive Collapse of the Lungs, Ann. Surg. **82**: 364 (Sept.) 1925.

7. Coryllos, P. N., and Birnbaum, G. L.: Lobar Pneumonia Considered as a Pneumococcus Massive Atelectasis of the Lung, Bull. New York Acad. Med. **4**: 384-399 (March) 1928; Obstructive Massive Atelectasis of the Lung, Arch. Surg. **16**: 501-559 (Feb.) 1928.

8. Elwyn, Herman: Postoperative Pneumonia, J. A. M. A. **82**: 384 (Feb. 2) 1924.

9. Scott, W. J. M., and Cutler, E. C.: Postoperative Massive Atelectasis, J. A. M. A. **90**: 1759-1763 (June 2) 1928. Scott, W. J. M.: Postoperative Massive Collapse of the Lung, Arch. Surg. **10**: 73-116 (Jan.) 1925. Scott, W. J. M., and Joelson, J. J.: Postoperative Massive Atelectasis, ibid. **15**: 855-870 (Dec.) 1927.

10. Sise, L. F.; Mason, R. L., and Bogan, I. K.: Prophylaxis of Postoperative Pneumonia: Preliminary Report of Some Experiments After Upper Abdominal Operations, Current Researches in Anesthesia and Analgesia, May-June, 1928.

11. Dzialoszynski, A. (with Prof. A. W. Meyer): Apparatur zur Kohlensaureinhalation und bildliche Darstellung der Kohlensäureanwendung am Kranken, Deutsche Ztschr. f. Chir. **205**: 22, 1927. Fisher, E.: Prevention of Postoperative Lung Complications by Inhalation of Carbon Dioxide, Zentralbl. f. d. ges. Med. (sec. Zentralbl. f. Gynäk.), 1928, Aug. 11, no. 32, p. 2010.

12. Coryllos, P. N., and Birnbaum, G. L.: Lobar Pneumonia Considered as Pneumonic Lobar Atelectasis, Arch. Surg. **18**: 190 (Jan.) 1929.

Cutler and Scott have demonstrated, carbon dioxide is the ideal agent for inducing the deep breathing requisite to counteract atelectasis.

It is indeed highly improbable that even the most vigorous respiratory effort can remove any considerable amount of the thick and sticky secretion in a fully developed pneumonic area. But even if this is true as regards areas already acutely infected, hyperventilation may still have prophylactic value in relation to other areas of the lung and tend to prevent the spread of the pneumonic condition.

In support of this view, the investigations by Haldane and his collaborators [13] some years ago are suggestive. They showed that even in a normal man the voluntary maintenance of shallow and correspondingly rapid breathing tends to produce cyanosis. The explanation which they established is that during shallow breathing considerable areas of the lungs remain unventilated. Such areas as are ventilated are overaerated, and the carbon dioxide content of the blood passing through these areas is reduced below normal, while the blood passing through the unventilated areas retains a carbon dioxide content above normal. These streams uniting in the left ventricle may afford a normal carbon dioxide content in the arterial blood. But the oxygen content is not normal, for the stream through the overventilated areas can take up only a normal amount of oxygen in combination with hemoglobin, while the stream through the unventilated areas remains unoxygenated. The mixed blood in the arteries comes thus to be incompletely oxygenated; and cyanosis may thus be induced experimentally even in a normal individual. Rapid shallow breathing has been produced experimentally by Binger, Brow and Branch [14] by the intravenous injection of a suspension of starch which results also in multiple emboli, congestion and atelectasis in the lungs.

As shallow breathing is one of the most characteristic phenomena of pneumonia it may be fairly inferred as probable, on the basis of these facts, that the cyanosis seen in patients with pneumonia may be in part caused by the shallow breathing, which leaves unaerated considerable areas of the lungs which are otherwise still free from infection.

From the work of Jackson, Cutler and Scott, Coryllos and Birnbaum, Haldane, Binger and their collaborators, the following series of events is indicated as probably playing a considerable part in the spread of pneumonia through the lungs: When a pneumonic area has developed, the irritation of the vagal endings induces shallow breathing. Such breathing leaves considerable areas of the lungs unventilated. In these areas atelectasis may develop and infection of these unventilated and undrained areas may develop into a full pneumonia.

While the foregoing discussion involves a considerable element of hypothesis as to the extent of benefit derivable from inhalational treatment, the hypothesis rests on well demonstrated clinical facts and experimental observations. It seems to justify careful study, both experimental and clinical, of this prophylaxis against atelectasis in unventilated portions of the lungs. It should be expressly stated, however, that the inhalation of carbon dioxide is not here suggested as immediately a substitute for the prolonged inhalation of oxygen, but rather as an auxiliary of that therapy. The inhalation must be adjusted as the patient responds to the stimulation. The objection to the inhalation of carbon dioxide which is most often raised, namely, that it might "strain the heart," may be set aside as invalid; for extensive experience has demonstrated that no such effect of carbon dioxide in physiologic amounts (from 5 to 7 per cent) is ever induced. On the contrary, heart strain, which is one of the sequels of asphyxia when untreated, is prevented by the inhalational treatment. The inhalation of carbon dioxide in physiologic amounts is, in fact, as compared with most drugs and other therapeutic agents and methods, an extremely mild form of stimulation. But it is highly specific in its effects.

On the experimental side we are undertaking in collaboration with Drs. Coryllos and Birnbaum a study of the effectiveness of hyperventilation in preventing and counteracting atelectasis induced mechanically or by bacteria. On the clinical side some of our colleagues at Bellevue Hospital, New York, and at the New Haven Hospital, have undertaken to determine, as opportunity may offer, the prophylactic value of carbon dioxide inhalation in the early stages of pneumonia. But it is highly desirable that in both fields such others as are interested in this topic and have facilities for investigation should attack it from various angles.

SUMMARY

Hyperventilation of the lungs by deep breathing under inhalation of carbon dioxide in proper dilution has proved effective in the prevention of postoperative pneumonia. It is effective also in the prevention of the pneumonia that may follow carbon monoxide asphyxia in untreated cases.

After anesthesia and asphyxia alike, respiration tends to be depressed. During this period of shallow breathing, parts of the lungs may remain unventilated and thus may become atelectatic. Pneumonia may develop in these areas unless special measures are taken for their reinflation. The distention of these unventilated and collapsed areas by the deep breathing which inhalation of carbon dioxide produces counteracts the atelectasis and prevents the development of pneumonia.

In many cities the inhalators used by the rescue crews of the gas companies and fire departments for the treatment of carbon monoxide asphyxia are now frequently applied also to patients with pneumonia. The carbon dioxide mixed with the oxygen in these inhalators induces deeper breathing. The results are apparently beneficial although not as yet of definite evidential value. In view of the effectiveness of inhalation of carbon dioxide in the prevention of postoperative and postasphyxial pneumonia, the possible value of inhalation of 5 per cent carbon dioxide in oxygen as a prophylaxis for the atelectasis that occurs early in pneumonia of other origins seems to deserve both experimental and clinical study.

13. Haldane, J. S.: Respiration, New Haven, 1922, pp. 132-144.
14. Binger, C. A. L.: Experimental Studies on Rapid Breathing: II. Tachypnea, Dependent upon Anoxemia, Resulting from Multiple Emboli in the Larger Branches of the Pulmonary Artery, J. Clin. Investigation **1**: 155 (Dec.) 1924.

Abuse of Physical Therapy.—Physical therapy has in many instances been received with undue enthusiasm and used with little knowledge. If properly used it may justly be regarded as deserving of its proper place in the general scheme of the practice of medicine and surgery. It is, however, a fallacy to regard it as an exclusive method. I do not wish in any sense to belittle its true value but I do desire to point out that some of us who are specifically engaged in this work realize that exorbitant claims have been made by persons who are using apparatus as a means of making money rather than as a means of treating disease.—Ewerhardt, F. H.: Physical Means in the Treatment of Arthritis, *J. Missouri M. A.*, January, 1929.

ACUTE MILIARY TORULOSIS OF THE LUNGS *

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Among the reports [1] of human infection with *Torula histolytica*, there are only a limited number that mention specific changes in the lungs, and an analysis of these reports leads to the conclusion that most if not all of them are descriptions of chronic lesions or lesions of considerable standing, while those comparable to miliary tuberculosis of the lungs have not been mentioned. The account by Stoddard and Cutler [2] reports extensive lung changes in the second of the two patients examined post mortem. The upper lobe of the right lung was shrunken and contained a large consolidated region, which was firm like fibrous tissue and composed of gray-white nodules as large as 2 mm. in diameter. The mass was irregular and had nodular extensions into the surrounding tissue. No parts contained caseated or calcified tissues or cavities. Scattered elsewhere were small miliary nodules resembling those of the consolidated region, and in the pleura were a number of small flat nodules. The left lung was similar, but the consolidation was more extensive and occupied most of the upper lobe. In microscopic preparations there were dense masses of hyaline fibrous tissue arranged in nodular whorls, without necrosis or caseation. Along the margin were small nodules of lymphoid tissue, endothelial cells and giant cells, lesions closely resembling tuberculosis but without caseation. A few yeastlike organisms were enclosed in these places.

Similar changes in the lungs, although not described with a great detail, are mentioned by Rusk and Farnell [3] in a report on systemic oidiomycosis. Bettin [4] found an abscess 7.5 cm. in diameter, filled with a gelatinous sticky substance, in the right lung of a woman infected with torula. About this was only a slight inflammatory reaction. Microscopic preparations of the tissues along the edge of the abscess contained alveoli filled with yeast organisms, but no giant cells or distinct tubercles.

Sheppe [5] described the appearance of the lungs at postmortem of a farmer, a native of Virginia, aged 50, who died with the clinical diagnosis of pneumonia. He had been troubled with joint pains for four months before receiving hospital care, and on the twelfth day in the hospital suddenly became ill with pneumonia. The leukocytes never exceeded 8,000 per cubic millimeter and the patient died nearly two months after the onset of the acute symptoms. Only the chest and abdomen were examined after death. The right lung alone was extensively diseased. The lower lobe was moderately firm on palpation, although the consolidation was not as definite as that noted in the gray stage of lobar pneumonia. There were no changes in the parietal or visceral pleurae. On surfaces made by cutting, the lung tissues were covered with a gelatinous glairy substance, and the brown tissue underneath was divided into irregular nodules. A relation of the nodules to the bronchi could not be established, and between the nodules was crepitant lung tissue. In microscopic preparations, the peribronchial tissues were infiltrated with small mononuclear cells, and within the lumens were masses of yeast cells. The walls of the alveoli were thickened by a growth of fibrous tissue and within the lumens were desquamated alveolar epithelium, erythrocytes, small mononuclear cells and a few yeast cells. There were occasional plasma cells and giant cells, but fibrin was not present.

The lungs in the case reported by Freeman and Weidman [6] showed hypostatic congestion but no pleuritis or consolidation, and in the case described by Pierson [7] there were old scars in the upper part of the left lower lobe and some caseated places in the peribronchial lymph glands. No mention is made of a microscopic examination of the lungs in either of these reports. Rappaport and Kaplan [8] record the lung changes observed by Dr. D. J. Davis. There were many gray nodules from 0.5 to 1 cm. in diameter in the left lower lobe, and in the apex of the left upper lobe was an encapsulated caseated nodule from 1.5 to 2 cm. in diameter. In the right upper lobe was a puckered scar 1 cm. in maximum diameter near a small cavity, and elsewhere in the upper and middle lobes were two other gray caseated nodules. Two large abscesses were present in the lower lobe. In histologic preparations of the lungs certain lesions were tuberculous, but others from the margin of the abscesses of the right lung had alveoli containing many nuclear remnants, plasma cells, round cells, old fibrin and many foreign body giant cells containing yeastlike organisms.

REPORT OF CASE

The opportunity to study acute lesions of human lungs caused by *Torula histolytica* came from the postmortem examination of a negress, aged 30, who was admitted to St. Luke's Hospital, Sept. 9, 1927, because of an abdominal tumor, headache and pain in the chest. The tumor had been noticed for about five years and only recently had caused discomfort. The headache was of only two days' duration. September 14, following a clinical diagnosis of fibromyomas of the uterus, Dr. H. O. Jones removed the fundic portion of the uterus with many fibromyomas, the left fallopian tube and the left ovary. The postoperative course was uneventful until fever was noted on the eighth day and a few râles were heard in the left lung. By October 4, the laparotomy wound had healed and the heart and lungs were without physical signs of disease, but the evening temperature was 102 F. Roentgen examination by Dr. E. L. Jenkinson, October 7, revealed recent changes in the accessory nasal sinuses. At this time the temperature ranged between 100 and 102, and the headache increased in severity and finally became continuous.

The spinal fluid removed, October 16, contained 520 cells per cubic millimeter. The globulin tests were positive, and the Wassermann reaction was weakly positive. A presumptive diagnosis of tuberculous meningitis was made, although acid-fast bacilli had not been demonstrated. In cultures of the spinal fluid withdrawn, November 4, *Torula histolytica* was identified. These organisms were isolated repeatedly in spinal fluid withdrawn from time to time. At a number of neurologic examinations, Dr. George W. Hall observed the physical conditions characteristic of a chronic meningitis. Persistent headache was an outstanding clinical symptom. A gradual decline in strength and nourishment occurred, and the patient died, Feb. 10, 1928, at 6:12 p. m.

The postmortem examination of the trunk, head, neck and spine was made in the morning of February 11. The anatomic diagnosis, in part, was: chronic torula leptomeningitis and pachy-

* Aided by the Winfield Peck Memorial Fund.
* From the Henry Baird Favill Laboratory and Medical Service "B" of St. Luke's Hospital.

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4. Bettin, M. E.: California & West. Med. **22**: 98 (March) 1924.
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meningitis; multiple chronic torula tubercles of the dura along both middle meningeal arteries and gasserian ganglions with erosions of the inner tables of the greater wings of the sphenoid; acute disseminated miliary torulosis of the lungs, and marked edema of the brain and leptomeninges.

There was no fluid in either pleural cavity. The apex of the right lung was bound to the parietal pleura over an area about 2 cm. in diameter. On the pleura of this lung in different places was a thin fibrinous exudate. The pleural surfaces along the interlobar fissures were fused together by fibrous tissue and the posterior portions of the lung were firmer than the anterior portions, though both were increased in consistency. Palpation disclosed fine, shotlike, closely arranged regions of consolidation from 1 to 4 mm. in diameter. On the two surfaces made by bisecting this lung through the hilum there was dark red lung tissue, against which, in contrast, were gray-red, slightly raised, round or irregular, granular, firm places from 1 to 3 mm. in diameter. The irregularity in size and outline of these nodular regions corresponded with the dimensions of several or more air sacs filled with an exudate. The margins of these places were not sharply limited, as in a miliary tubercle, but merged into the bordering lung tissue. They were seen best in the upper lobe, and in this portion of the lung they were closely arranged together so as to comprise easily from 60 to 70 per cent of the lung substance, but less of the other lobes. The intervening lung tissues in the lower posterior portions were dark red with hemorrhages and hyperemia. The lining of the bronchi was markedly reddened. The right lung weighed 810 Gm.; the left weighed 230 Gm. and was much smaller in volume. There was no fibrinous exudate on the pleura of the left lung nor fusion of the lobes by fibrous tissue. The surfaces made by cutting were fluffy and gray-red and everywhere contained air. In the unfixed tissues there were no gray nodules.

Both lungs were fixed in solution of formaldehyde for museum preservation, and, from the posterior portion of the right lower lobe, tissues were taken for histologic examination and mordanted in Zenker's solution. The sections prepared by the paraffin method were stained with hematoxylin and eosin, with phosphotungstic acid hematoxylin, and with eosin and polychrome methylene blue (methylthionine chloride-U. S. P.). The gray places were regions of lung tissue consolidated by an acute inflammation. The alveoli in these contained fibrin, many polymorphonuclear leukocytes, usually an equal proportion of mononuclear cells, and variable numbers of red cells. Some alveoli, especially those along the margin of the consolidated places, contained chiefly masses of red cells and fibrin. The lining cells of the alveoli were desquamated, just as in other acute inflammations of the lungs. A cellular exudate filled the lumen of the terminal bronchioles. Among the cells of this exudate, both in the alveoli and in the bronchioles, were torula organisms, singly and in clusters. They were found with some difficulty in the hematoxylin-eosin stained preparations, because of the similarity in their size and staining qualities to the cells of the exudate. In the sections stained with phosphotungstic acid hematoxylin, the torula organisms were orange-yellow, like collagen fibers, and were found more readily. They were between the cells of the exudate and within phagocytes. Some of these phagocytic cells had an abundant cytoplasm and approached in dimension that of a giant cell, but definite multinucleated giant cells were rare. There was no destruction of the lung tissues, as with tuberculosis, nor scar tissue or newly grown connective tissue.

Some of the sections were stained by the Weigert-Gram method and others with methylene blue, but in none were bacteria found. There is no convincing evidence, therefore, that bacteria occurred in the tissues along with the torula organisms.

In cultures of the spinal fluid and in blood from the right ventricle of the heart removed during the postmortem examination, *Torula histolytica* was isolated.

SUMMARY

Acute miliary torulosis of the lungs follows a blood stream dissemination of the torula organisms from some chronic lesion. Although other reports mention chronic changes of the lungs, our case seems to be the only one in which all of the lung changes were acute. The chronic lesions from which the torula organisms were liberated probably are those in the meninges or tissues of the middle cranial fossa. The location of these about the gasserian ganglions and the middle meningeal arteries, as noted [9] also in another death from torula meningitis, suggests that the infection of the meninges has extended along these structures from the nasopharynx.

SOFT EYEBALL (HYPOTONIA BULBI) IN DIABETIC COMA*

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In view of the maze and mass of clinical data that find their way into medical literature, it is little wonder that an occasional observation of value and interest remains unnoticed, or receives but scant courtesy, and thus falls by the wayside as an unwanted waif.

In 1903 Krause first reported hypotonia of the eyeball in diabetic coma. Shortly thereafter Heine reported his observations corroborating those of Krause. There followed a few further notations, but in the main references to this symptom were extremely meager. It remained for Riesman [1] to rescue the Krause-Heine observation [2] from the few dusty tomes that had given it refuge. The same degree of relative neglect that followed Krause's original publication has been accorded Riesman's report, there being little reference to the sign in publications of the past decade; in fact, aside from a report of two cases by W. S. Middleton,[3] a search of the American and English literature fails to uncover data other than its obscure mention, save by Joslin, and such reference as is made is given so little emphasis as to leave no impression of its possible or reputed clinical value. Even as recently as 1927, in an authoritative article on eye conditions in diabetes, an ophthalmologist, after having mentioned many other eye symptoms, gave only cursory mention to this sign and referred to it merely as having been reported by Riesman and Middleton but contradicted by another author. No personal observation is noted or opinion expressed. This is all the more strange because the ophthalmologist's aid is frequently sought in cases of coma; certainly he should be familiar with the reputed value of altered tension of the eyeball as related to diabetic coma. As a matter of fact, slight reference to this sign is made even in textbooks on ophthalmology, and one of the most valued—that of Fuchs—makes no mention of it whatever. That it is rarely touched on by clinical teachers is evidenced by the circumstance that of the many hospital interns hailing from different schools with whom I have come in contact in the past few years, only one was aware of this phenomenon. French authors have been sufficiently impressed with Riesman's deserts—in calling attention to this sign—to speak of it as Riesman's sign (signe de Riesman).

As to the frequency and constancy, i. e., the diagnostic value, of this finding in diabetic coma, there is not entire unanimity. In Krause's earlier report,[4] made in conjunction with Heine, he mentions observations in twenty-two cases, in all of which the eyeballs were soft and compressible. He did not find the sign in corpses

9. Hall, G. W.; Hirsch, E. F., and Mock, H. E.: Torula Hystolitica Meningo-Encephalitis, Arch. Neurol. & Psychiat. **19**: 689 (April) 1928.

* Read before the Milwaukee Academy of Medicine, June 12, 1928.

1. Riesman, David: Soft Eyeball, J. A. M. A. **66**: 85 (Jan. 8) 1916.
2. These and other early references are given by Riesman (footnote 1).
3. Middleton, W. S.: Wisconsin M. J. **21**: 189 (Oct.) 1922.
4. Krause, P.: Deutsche med. Wchnschr., 1907, p. 84.

or in cachectic patients. Heine claims specificity for the sign; i. e., that soft eyeballs in coma prove the coma to be of diabetic character. The most recent and largest contribution on this subject is again made by Krause,[5] who reports a total of sixty observations. Krause supports Heine's contention that soft eyeball is not found in comas other than those of diabetic origin, but goes a step further in claiming constancy of the sign in diabetic coma. Gallus[6] supports the Heine and Krause assertions as to specificity of the sign but denies its constancy, since he himself has encountered several instances in which soft eyeball was not present. This has also been Riesman's experience.

While accuracy of observation should demand the use of a tonometer, the tension of the eyeball can be gaged approximately by digital palpation. But as in cases of diabetic coma only emergency observations are usually made, the tonometer is not likely to be frequently available.

It may be of interest to report briefly some experiences of the past few months that stress not so much the corroborative value of eyeball hypotension in the coma of known diabetes as its diagnostic importance in unsupported cases.

REPORT OF CASES

CASE 1.—A middle-aged man, both of whose legs had suffered compound fracture in a railroad accident, was progressing reasonably well, having recovered from the immediate shock, when, on the afternoon of the second day following, he suddenly became dyspneic. Called in counsel at this time, I was informed that he had developed pneumonia. I found the patient semiconscious, with a practically normal temperature, a fairly good pulse, and marked air hunger, with beginning pulmonary edema. Evidence of pneumonia was lacking. Palpation of the eyeballs revealed a putty-like softness. A diagnosis of probable diabetic coma was made, and this was corroborated by the finding of a trace of urinary sugar in the admission specimen; other positive data were then found on further investigation. The patient died in coma during the succeeding night, despite the institution of appropriate treatment.

CASE 2.—A woman with diabetes of many years' standing—one of the earliest to whom I gave insulin—had a very low sugar tolerance, and for several years had been compelled to take about 90 units of insulin daily. In the course of a bronchopneumonia she had reduced her diet and omitted some of her wonted doses of insulin. When first seen she was drowsy, breathing heavily and mentally dull but conscious; the eyeballs were soft. This led to a diagnosis of probable beginning diabetic coma. The patient was immediately hospitalized and the diagnosis was confirmed. Under appropriate treatment recovery was prompt and complete; as soon as improvement set in, the eyeballs regained their normal tension. It was noted that during the coma one eye had more of putty softness than the other.

CASE 3.—A girl, aged 10 years, admitted to the hospital in deep coma, was at first thought to have an acute surgical condition of the abdomen. At the height of the coma the patient was found to be diabetic; the tension of the eyeballs was demonstrably reduced. The patient recovered without operation, following the use of insulin and dextrose, and on convalescence developed an entirely normal sugar tolerance. Because of the very acute abdominal symptoms ushering in and attending the diabetes, it is believed that the patient had an acute pancreatitis which led to the acute diabetic acidosis. The hypotension was here a factor in quickly supporting the diagnosis.

CASE 4.—Quite by accident I overheard an intern speak of a patient, known to have diabetes, who had just been admitted to the hospital, as having diabetic coma. Finding the eyeball tension normal, I hazarded some doubt as to the diagnosis. It was gratifying, therefore, to learn later that the patient's coma was due to renal deficiency: chemical analysis of the blood showed a high nitrogen retention (nonprotein nitrogen, 73.2; creatinine, 3.1; urea nitrogen, 62.8) but a high blood sugar as well. Urinalysis showed a specific gravity of 1.017, albumin, hyaline and granular casts, and sugar, but no acetone or diacetic acid. While there was reason clinically to consider this patient diabetic, the fatal coma was obviously based on other factors. The normal eyeball tension here proved of diagnostic value.

CASE 5.—While visiting a sanatorium recently I was told of an interesting development—an attack of hysteria—in a young diabetic patient. The symptoms were thought not to be those of coma because the patient thrashed about violently, clenched her hands and arms, and exhibited none of the characteristic respiratory signs of diabetic coma. I found the patient, after hospitalization, in a stupor, quiet, but breathing heavily; the eyeballs were far softer than normal. The attending physician had palpated the eyeballs when first called to see her at her home, and they did not then impress him as being hypotonic. During the interval between his first visit, when the symptoms were those of marked agitation suggesting hysteria, and the present obvious diabetic coma, several hours had elapsed, and in this interval the eyeballs had undergone marked softening. It would seem that the acidosis preceding the coma had elicited an hysterical outburst as its first response in a highly neurotic person, the coma resulting with the deepening intensity of the toxemia.

Case 5 recalls two similar previous experiences, one with a chronic nephritic patient who developed an emotional outburst of typical hysteria, laughing and crying most violently, following which a fatal coma supervened; the other with a diabetic patient who showed similar hysterical signs, which gave way, as in the case here reported, to a fatal coma.

COMMENT

Etiologically, little has been adduced in explanation of the sign that is more than conjectural. The ketones may be a factor, Riesman having reported a case of diabetic coma without acidosis in which the eyeball tension was normal. Hertel[7] believes that the osmotic action of various salts plays a part, and he has been able to reproduce the symptom in animals by the injection of various salts. Similarly, and more recently, Lambert and Silbert[8] have demonstrated in the human subject that the intravenous injection of 300 cc. of hypertonic salt solution caused a drop of about 40 per cent in the intra-ocular pressure; they believe that this action is due to a change in the osmotic pressure of the blood. Krause found a soft eyeball in depancreatized dogs, and this has recently been corroborated by Macleod of Toronto. Blood pressure has been found not to bear any relation to the eyeball tension.

The sign has no prognostic value. On the basis of his experience in twenty-two cases, Krause[4] expressed the opinion that the hypotonia in diabetic coma offered a bad prognosis. Krause's observation, however, was made in preinsulin days (1907) and is therefore admittedly not in accord with present-day experience.

SUMMARY

Hypotonia bulbi is not found in comas other than those of diabetic origin. Constancy of the sign in diabetic coma is not conceded, but the assertion is made that it is present with striking frequency. It is absent in diabetic acidosis without coma. The hypotonia is most pronounced at the height of coma, and quickly recedes as the coma is overcome. The eyeball tension may not be lowered an equal degree in the two eyes.

5. Krause, P.: Abstr. Klin. Monatsbl. f. Augenh., 1924, p. 491.
6. Gallus: Abst. Klin. Monatsbl. f. Augenh., 1924, p. 491.
7. Hertel, E.: München med. Wchnschr., 1913, p. 1191.
8. Lambert, R. K., and Silbert, Samuel: Effect on Intra-Ocular Pressure of Intravenous Injections of Hypertonic Salt Solution, J. A. M. A. 90: 1435 (May 5) 1928.

In the five cases here presented the reduced tension of the eyeballs in diabetic coma proved itself of diagnostic value. From the paucity of comment on this phenomenon in medical literature, it is evident that the sign has lacked the general recognition which its interest and occasional importance warrant. In making this report I have been actuated not so much by a desire to emphasize the academic interest of a somewhat neglected clinical observation as to point out the scant courtesy that has been accorded an important diagnostic contribution that should be given almost a specific value.

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THE RELATIONSHIP OF NUTRITION TO PNEUMONIA IN INFANCY AND CHILDHOOD*

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One of the greatest problems in the medicine of today is that of acute disease of the respiratory tract, not only of children but also of adults. Diarrheal diseases have been controlled in institutions and throughout the community; the mortality, which used to be highest in the summer, has now shifted to the winter and early spring months, the period of prevalence of respiratory infections. Their complications, such as otitis media, mastoiditis, empyema, and other frequently encountered sequelae are often of even greater severity and importance than the original infection. This problem of respiratory diseases applies particularly to the housing and care of infants and young children in institutions. Its importance in children under 5 years of age was stressed in a preliminary report published by the Chicago Pneumonia Commission.[1] It was found that the death rates in this age period were exceedingly high, outranking the mortality due to diarrheal diseases. A subsequent survey[2] showed that, among 6,000 cases of pneumonia, fully one third occurred in children during the first five years of life, and that there was a striking reduction in incidence at the end of this period.

In the past we[3] have tried to lessen the occurrence of these "winter infections" by irradiating controlled groups of infants with the mercury vapor and the carbon arc lamps. As previously reported, when these methods were employed the results were unsatisfactory. No comparative diminution in the incidence of respiratory diseases was noted in the children exposed to the ultraviolet rays. This past winter the problem was attacked in an entirely different manner; for the time being all attempts at creating an artificial immunity were discontinued and reliance was placed on purely mechanical measures of protection against infection. We endeavored to prevent the spread of respiratory diseases in a ward of infants by means of a technic similar to that elaborated and utilized in the army during the recent war. The results of this study will be published in another communication.

This report deals with an analysis of more than 500 cases of pneumonia which occurred during a period of twelve years in an institution sheltering children under 5 years of age. It seemed opportune to review our experience of the past in this field in order to ascertain whether a broad view of this subject might afford points of interest and of value in conducting a campaign against respiratory diseases. Perhaps nutrition played an important rôle, and, if it was considered, might materially help to reduce the morbidity and mortality; perhaps age was of significance and it would be found that children of different age periods have a varying susceptibility and should be treated differently; perhaps a study of the part played by rickets as a cause predisposing to respiratory diseases would aid in solving the problem. These and other factors were carefully considered in connection with our experience of the past twelve years.

The institution with which we are concerned is a model child-caring home of modern construction. The buildings are unobstructed on all sides, thereby assuring an abundance of sunlight and fresh air, and are surrounded by spacious playgrounds. Most wards have contiguous verandas. The infirmary has a southern exposure, and an open porch for the treatment of pneumonia. The medical supervision, nursing care, and equipment are excellent. Every effort is made to avoid overcrowding and to eliminate those factors which tend toward institutionalism or "hospitalism" so clearly defined by Ericksson.[4] Marasmus or infantile atrophy practically never develops here. The diet of the children is adequate as to quality, quantity, caloric value and vitamin content. To those under 3 years of age cod liver oil and orange juice are given daily. The mortality from all causes in this institution for the past twelve years has totaled 159, giving a death rate of 23.1 per thousand. Of this mortality, that from pneumonia alone was seventy-four, a death rate of 10.7 per thousand, almost one-half the total.

TABLE 1.—*Age Distribution of Children in Institution (1916-1927) and of Those with Pneumonia*

Age	Population, 1916-1927	Per Cent of Total	Cases of Pneumonia, 1916-1927	Case Rate per Age Group, per Cent
0 to 6 months	505	7.3	22	4.3
6 months to 1 year	739	10.7	106	13.0
1 year to 2 years	1,392	20.2	214	15.4
2 to 3 years	1,318	19.1	105	8.0
3 to 4 years	1,317	19.1	41	3.1
4 to 5 years	1,623	23.6	17	1.0
Totals	6,894	100.0	505	7.3

The inmates of this home come from the poorer classes of the Jewish population of the city, and vary in age from a few days to 5 years. The duration of their stay averages about eighteen months, thereby affording excellent opportunity for observation over an extended period in conditions both of health and of disease. Ten per cent of the children are illegitimate. The reaction to the tuberculin test has been positive in about 8 per cent, whereas routine Wassermann reactions have been persistently negative..

It is with the important group under 5 years of age that we are vitally concerned. Examination of table 1 shows that almost 7,000 children of this age period were

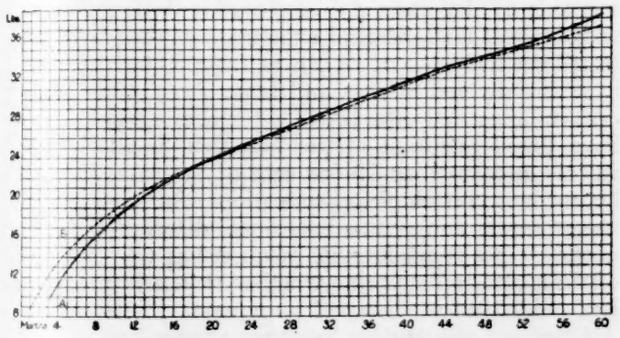
* From the Home for Hebrew Infants.
* Read before the Bronx Pediatric Society.

1. Bundesen, H. N.: Chicago Pneumonia Commission: Preliminary Report, J. A. M. A. **84**: 884 (March 21) 1925.
2. Jones, H. O.: Prevalence and Prevention of Acute Respiratory Diseases in Children Under Five Years of Age; Chicago Pneumonia Commission, Report No. 2, Am. J. Dis. Child. **31**: 373 (March) 1926.
3. Barenberg, L. H.; Friedman, Irving; and Greene, David: The Effect of Ultraviolet Irradiations on the Health of a Group of Infants, J. A. M. A. **87**: 1114 (Oct. 2) 1926. Barenberg, L. H., and Lewis, J. M.: The Effect of Carbon Arc Irradiation on the Health of a Group of Infants, J. A. M. A. **90**: 504 (Feb. 18) 1928.
4. Ericksson, Z.: Ueber Anstaltsschäden der Kinder: Hospitalismus in Kinderheimen, Acta Pædiat. (supp.) **4**: 1-135, 1925.

cared for in this institution during the past twelve years, and that they were about evenly distributed in each age division, the number being highest for those between 4 and 5 years, and lowest for those under 1 year. In regard to the age distribution in those with pneumonia, it may be seen that the case rate was highest, about 15 per cent, in children between 1 and 2 years, 13 per cent in those from 6 to 12 months, and only 1 per cent in those between 4 and 5 years.

Of particular interest are the infants under 6 months of age, for although the case rate for this group was only 4 per cent, the fatality rate was more than 40 per cent (table 2), a rather high mortality in view of the low morbidity. The gradual diminution in the fatality rate as the fifth year of life was approached is also striking. Undoubtedly age is an important factor in regard to the occurrence and prognosis of pneumonia.

It should be borne in mind that the recurrent cases of pneumonia comprised more than one third of the entire series. The fatality rate of this group was surprisingly low, being only one-fifth as great as in children who had only one attack of pneumonia. The comparative figures, shown in table 3, are evidently of considerable value and importance in determining the outcome in a recurrent case of pneumonia.



Weight curve of children of institution compared with standard of United States Children's Bureau: *A*, solid line, institution; *B*, broken line, children's bureau.

Naturally the fatality of pneumonia varied from period to period, but we had no idea that there would be such a marked difference (table 4). For example, in the seven year period 1916-1922 the rate was 23 per cent, whereas in the five year period 1923-1927 the rate was only 7 per cent. However, in spite of this great reduction in fatality, the morbidity remained approximately the same during these two periods. Disappointing as this was from the standpoint of the incidence of pneumonia, it showed that we had accomplished something in the care and treatment of the disease. We attribute the reduction in deaths to the fact that a more spacious infirmary was built in 1923 and to the employment of the open-air method of treatment. In view of the experience of the past winter, which will be given in detail elsewhere, we attribute the high morbidity of the latter period to the fact that since 1923 visiting days have been increased to one a month, instead of one in every three months, as was the rule previous to this year.

In the study of the predisposition of children to pneumonia, the part played by nutrition has attracted particular interest. Meyer [5] and others have concluded that if any marked reduction in the incidence of morbidity and mortality from respiratory diseases is to be accomplished, undernutrition must be avoided. The peculiar lack of resistance of rachitic children to infection has also been emphasized. Hill and Breeze,[6] however, showing the lack of relationship between malnutrition and contagious diseases, have stated that although malnutrition seems to be of greater importance in the occurrence of acute and chronic respiratory infections, even in these it may not be of as great consequence as is usually believed. Experiments in animals, especially the recent work with the various vitamins, have served to emphasize the connection of faulty nutrition and infection. It should be remembered, however, that marked undernutrition or deficiencies are generally associated with such feeding experiments.

TABLE 2.—*Age Distribution in Fatal Cases of Pneumonia*

Age	Cases of Pneumonia	Number of Deaths	Fatality Rate, per Cent
0 to 6 months	22	9	40.9
6 months to 1 year	106	15	14.1
1 year to 2 years	214	33	15.4
2 to 3 years	105	12	10.5
3 to 4 years	41	4	9.8
4 to 5 years	17	1	5.9
Totals	505	74	14.7

In order to elucidate the rôle of nutrition in pneumonia, the weights—which may be regarded as the most readily available criterion of nutrition—of nearly 2,000 healthy children who were cared for in our institution during the past twelve years were tabulated and a weight curve was derived. These weights were taken, as nearly as possible, at the height of the pneumonia season. For purposes of comparison, a similar graph was made from the standards of the Children's Bureau of the United States Department of Labor.[7] The two curves have been plotted in the accompanying chart, from which it may be observed that the weight curve for our children falls below that of the Children's Bureau for every month up to the nineteenth, at which time the two converge. Our curve then crosses that of the United States standard and for the remaining months the children in our institution are somewhat heavier. This may be interpreted as follows: On admission the children under 1½ years of age are generally below the average weight, whereas, after having had a varying period of institutional care, they equal or even exceed the United States standard.

TABLE 3.—*Fatality Rate of Recurrent Cases of Pneumonia*

Attacks	Number of Children	Cases of Pneumonia	Number of Deaths	Fatality Rate, per Cent
Single	334	334	67	20.0
Recurrent	75	171	7	4.0

TABLE 4.—*Yearly Incidence of Pneumonia Fatality*

Pneumonia	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
Cases	39	86	41	13	32	15	16	45	60	65	37	56
Deaths	6	20	10	4	8	2	5	6	5	5	0	3
Fatality rate	15.4	23.2	24.4	30.7	25.0	13.3	31.2	13.3	8.3	7.7	0	5.3
	7 year period: 242 cases, 55 deaths, 23.0% fatality rate							5 year period: 263 cases, 19 deaths, 7.2% fatality rate				

5. Meyer, L. F.: Fünf und Zwanzig Jahre artzlicher Tätigkeit im Kinderasyl, Gesundh. f. d. Kindesalter **1**: 494 (July) 1926.

6. Hill, H. W., and Breeze, E.: Nonrelation of Malnutrition in School Children to Infection, Canad. Pub. Health J. **17**: 421 (Sept.) 1926.

7. Children's Bureau, U. S. Department of Labor: Average Heights and Weights of Children Under Six Years of Age, Washington, D. C., Government Printing Office.

This may be rather surprising in view of the prevailing impression that children in institutions decline in health and that their physical development is subnormal. Our results substantiate the early observations of Hess [8] that in well organized and properly managed institutions, good nutrition can be successfully maintained. Studies conducted by Holt and Fales,[9] as well as by Katz and Gray,[10] although dealing with somewhat older groups of children, have also strikingly indicated that excellent nutrition is compatible with institutional care.

TABLE 5.—*Weights of Patients with Pneumonia as Compared to Standard of Institution*

	I Overweight		II 0 to 10% Underweight		III 10 to 20% Underweight		IV 20% or More Underweight	
Age	No.	%	No.	%	No.	%	No.	%
Under 1 year....	30	6.3	36	7.6	25	5.3	33	6.9
1 to 5 years.....	104	22.0	124	26.1	72	15.1	51	10.7

TABLE 6.—*Weights in Recurrent Cases of Pneumonia as Compared to Standard of Institution*

	I Overweight		II 0 to 10% Underweight		III 10 to 20% Underweight		IV 20% or More Underweight	
Age	No.	%	No.	%	No.	%	No.	%
Under 1 year.....	11	6.6	14	8.4	13	7.8	12	7.2
1 to 5 years.....	26	15.4	41	24.4	28	16.6	23	13.6

In order to determine the state of nutrition of the children comprising the series with pneumonia, weights taken approximately one month prior to the onset of illness were compared with the standard of the institution. They were classified into four groups, as follows: overweight; 0 to 10 per cent underweight; 10 to 20 per cent underweight, and 20 per cent or more underweight. It was found unnecessary to consider primary and secondary cases of pneumonia separately, as no appreciable difference was noted in the end-results; the same held true in regard to sex. The results are shown in table 5. To facilitate comparison, group 1 may be combined with 2, and similarly group 3 with 4, the former combination representing the children within the range of normal weight, the latter those definitely underweight. In the first year of life the cases of pneumonia were distributed practically equally in each weight group, whereas for children over 1 year of age the incidence among the well nourished was almost twice as great, about 48 per cent, as among those markedly underweight, 26 per cent. Similar results were obtained in regard to recurrent pneumonia (table 6). Comparison with the standard of the institution showed that the frequency with which children developed pneumonia was not determined by body weight, and that those markedly underweight were not subject necessarily to repeated attacks. It is evident that nutrition, as gaged by body weight, does not bear any relationship to the occurrence of pneumonia.

Table 7 was next compiled for cases in which there was a fatal termination. In children from 1 to 5 years of age nutrition did not play a rôle as a causative factor in mortality, but under 1 year of age 20 per cent were found definitely underweight as compared to 13 per cent normal in weight. Although this difference is moderate and the total number of cases too few to permit of generalization, it suggests a possible tendency in this age group for the poorly nourished to succumb to pneumonia.

There is another important aspect of nutrition which must be studied in its relationship to respiratory diseases. Standard textbooks of pediatrics are almost unanimous in expressing the opinion that rickets is a factor predisposing to frequent intercurrent infections, particularly those of the respiratory tract, and that the rachitic child usually succumbs to some acute pulmonary disease. It should be remembered, however, that this opinion was based on the old clinical conception of rickets. Today, as a result of the widespread use of antirachitic therapy, a new and milder form of this nutritional disorder predominates and its recognition has become increasingly difficult. Recent investigations have brought to our realization the complexity of rickets and the fact that a broader conception of this disorder is essential. Hess and Unger [11] have emphasized the widespread prevalence of rickets when the newer methods of diagnosis are employed. With the aid of radiographic and chemical examinations they have estimated the incidence of rickets as from 50 to 75 per cent in artificially fed infants and from about 33 to 50 per cent in breast fed infants in the temperate zones. They have called attention to the fact that Schmorl found rickets in more than 90 per cent of the cases in which he made a histologic examination. In view of the newer conception of this nutritional disorder, it seemed necessary to reconsider its relationship to respiratory diseases and to determine whether rickets in the prevalent mild form predisposed to pulmonary infections.

Excellent opportunity has been afforded us to study this relationship by noting the comparative incidence of pneumonia in rachitic and nonrachitic children between the ages of 6 and 18 months. These two groups of children were observed under uniform conditions over the same period of years. The groups were clearly differentiated by means of monthly clinical and roentgen examinations, as well as by chemical tests of the blood. The children with rickets were found to have slight but definite beading, roentgenographic bone changes, such as cupping and fraying of the epiphyses, and an inorganic blood phosphorus of about 3.5 mg. per hundred cubic centimeters. Practically all of the nonrachitic children were protected by cod liver oil; a few, by ultraviolet irradiations. A comparison of the incidence of pneumonia in these two groups is given in table 8. Among the rachitic children, totaling 114, less than 4 per cent of pneumonia occurred, whereas among the 102 nonrachitic children, 16 per cent developed pneumonia, the greater number of cases falling

TABLE 7.—*Weights in Fatal Cases of Pneumonia as Compared to Standard of Institution*

	I Overweight		II 0 to 10% Underweight		III 10 to 20% Underweight		IV 20% or More Underweight	
Age	No.	%	No.	%	No.	%	No.	%
Under 1 year.....	2	2.9	7	10.2	2	2.9	12	17.7
1 to 5 years.....	12	17.7	11	16.1	10	14.8	12	17.7

8. Hess, A. F.: Institutions as Foster Mothers for Infants, Arch. Pediat. **33**: 96 (Feb.) 1916.

9. Holt, L. E., and Fales, Helen: Observations on the Health and Growth of Children in an Institution, Am. J. Dis. Child. **26**: 1 (July) 1923.

10. Katz, S. E., and Gray, Horace: Health and Growth of Children in an Institution, Am. J. Dis. Child. **27**: 464 (May) 1924.

11. Hess, A. F., and Unger, L. J.: Infantile Rickets: The Significance of Radiographic and Chemical Examinations in Its Diagnosis and Incidence, Am. J. Dis. Child. **24**: 327 (Oct.) 1922.

in the age group from 13 to 18 months. Thus, in the former group the occurrence of pneumonia was only one fourth as great as in the nonrachitic group. We do not wish to generalize on this phenomenon but to suggest that the mild rickets of today, by far the commonest type of this disorder, does not entail any increased susceptibility to pneumonia.

SUMMARY

In an institution in which the medical supervision, nursing care and equipment are excellent, 505 cases of pneumonia occurred during a period of twelve years among 6,894 children under 5 years of age. During this period the mortality from all causes was 159, a death rate of 23.1 per thousand. The mortality from pneumonia alone was seventy-four cases, a death rate of 10.7 per thousand children.

The highest pneumonia case rate, 15.4 per cent, occurred in children from 1 to 2 years of age, followed by a marked diminution in the rate as the fifth year of life was approached. The highest fatality rate, 40.9 per cent, was found in infants under 6 months of age; the lowest, 5.9 per cent, in children from 4 to 5 years. The fatality rate of recurrent cases of pneumonia was 4 per cent, as compared to 20 per cent for those children who had only one attack. The pneumonia fatality rate in this institution has been decreased during the past five years from 23.0 to 7.2 per cent, but the morbidity rate has remained the same.

The weights of the children in this institution compare favorably with the standards of the United States Children's Bureau. Admitted below normal, the children attain average normal weight at about 19 months of age and tend later even to exceed the standard, indicating that good nutrition can be successfully maintained in a child-caring institution.

Nutrition, as determined by body weight, did not bear any relationship to the occurrence of pneumonia or to the frequency with which children developed this disease. Similarly nutrition did not play any rôle in the incidence of pneumonia fatality, with the possible exception of infants under 6 months of age; the number of fatal cases in this age group were too few to permit of a definite conclusion.

A careful analysis of 114 cases of rickets led to the surprising result that the rachitic condition did not predispose to pneumonia. This rickets was of the mild type, which is by far the most prevalent form of this disorder in the community.

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TABLE 8.—*Comparison of Incidence of Pneumonia in Mildly Rachitic and Nonrachitic Children* *

	Number of Children	Age in Months	Total Number	Cases of Pneumonia	Percentage of Pneumonia
Rachitic....	114	6 to 12	65	2	1.8
		13 to 18	49	2	1.8
Nonrachitic	102	6 to 12	44	5	4.9
		13 to 18	58	12	11.8

* Nonrachitic children were protected by cod liver oil or ultraviolet irradiations.

Transference of Leprosy.—Although there can be no manner of doubt that leprosy is an infectious disease and that as such it can only be acquired from an antecedent case, nothing accurate is known concerning the method or methods by which the disease is transferred or of how or where lepra bacilli enter the body.—E. B. Vedder.

PAROXYSMAL SNEEZING AS AN EQUIVALENT OF THE PAROXYSMAL COUGH OF PERTUSSIS *

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In the past few years I have observed several cases of pertussis in which paroxysmal sneezing had partially or entirely taken the place of the usual spasmodic cough. As this symptom is not generally recognized, it was considered advisable to publish two case histories.

REPORT OF CASES

CASE 1.—M. J., a colored girl, aged 1 year and 8 months, seen in the Babies and Children's Dispensary, Cleveland, July 8, 1926, coughed considerably, had bronchial râles and registered a temperature of 37.6 C. (99.6 F.).

July 15, the cough was severe; the pharynx was injected, and there were large bronchial râles and a temperature of 37.3 C. (99.1 F.). A diagnosis of bronchitis was made. The patient vomited four times daily. She had a good appetite. The mother stated that the child did not whoop. The cough was "hard" and vomiting occurred during examination but there was no suggestion of any pertussis. The lungs and the throat were clear but there was a mucopurulent discharge from the nose. The temperature at this time was 37.6.

July 22, the cough was worse but still of an entirely unspecific nature. Vomiting and sneezing were now very frequent. The attacks were paroxysmal in nature, a number of sneezes following each other and leaving the child exhausted. There was a striking analogy to the usual paroxysmal cough. No whoop was heard. When the posterior pharyngeal wall was touched such an attack was elicited; from ten to twelve sneezes followed and were ended by the spitting and sneezing of a tenacious mucus through the mouth and nose. The lungs and throat were normal; the temperature was 37.6. An ulcer of the frenulum was present. No hemorrhages were seen. There was puffiness under the eyes.

July 28, the patient was seen at home. The child was heard coughing but entirely unspecifically. The mother stated that she had never heard crowing or stridorous respiration. There was less sneezing. At this time the child's brother showed a typical cough paroxysm of pertussis. In the girl the white blood cells numbered 27,220, with a differential count of: polymorphonuclears, 12 per cent; lymphocytes, 84 per cent; large mononuclears, 2 per cent; eosinophils, 1.5 per cent, and plasma cells, 0.5 per cent.

CASE 2.—J. K., a white boy, aged 2 months, seen in the Babies and Children's Hospital, Cleveland, Jan. 17, 1928, one week before developed a cough which became progressively worse. A definite whooping character of the cough accompanied by cyanosis was noticed. There was no fever or vomiting. The pharynx was red; the lungs were normal. The white blood cells numbered 36,000: polymorphonuclears, 20 per cent; lymphocytes, 75 per cent; eosinophils, 1 per cent, and large mononuclears, 4 per cent.

Progress of Paroxysms of Coughing and Sneezing

	January								February						
	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7
Paroxysmal coughs....	21	11	14	13	13	15	16	11	19	13	9	14	15	13	3
Paroxysmal sneezes...	2	2	9	10	8	7	10	6	7	5	6	4	6	10	3

January 18, between paroxysms of coughing, sneezing attacks were observed which simulated very closely the paroxysmal character of the cough.

January 19, the child had an attack of apnea probably caused by abdominal distention and poor position of the head. There were no convulsions.

January 13, the white blood cell count was 31,800; 16 per cent polymorphonuclears, 78 per cent lymphocytes, 5 per

* From the Babies and Children's Hospital of Cleveland and the Department of Pediatrics, Western Reserve University School of Medicine.

cent large mononuclears, and 1 per cent eosinophils. The temperature remained at 38 C. (100.4 F.) in a monothermic fashion with the exception of one rise to 40 C. (104 F.) lasting for a few hours. There had been a steady gain from 4,400 to 5,050 Gm. There was little vomiting. The sneezing and coughing continued in characteristic fashion as shown in the accompanying table.

COMMENT

Sneezing, if mentioned at all in the standard textbooks, is usually regarded as a symptom of secondary importance. Found in the catarrhal stage, the sneeze may be of considerable value in the diagnosis of early cases in which the cough is as yet quite uncharacteristic. However, it gains such value only when it assumes a paroxysmal character, which is to our knowledge not found in any other disease, with the possible exception of a severe hay-fever. The sneezing attacks are in their staccato repetition, their insistency and their exhausting nature so strongly reminiscent of the paroxysm of coughing that once such a case has been seen the symptom will not be missed again.

Undoubtedly the cases are infrequent in which the sneezing attacks supplant wholly or even partially the paroxysms of coughing. A preliminary search through the literature revealed only a mention in passing by Griffith.[1] Here, however, a reference was found to a valuable article by Szegö.[2] This physician, a Hungarian in Abbazia, reported in 1900 a description of a case in a child, aged 3 years. Aside from the characteristic picture, which is quite analogous to that in patient 1, the diagnosis of pertussis was further strengthened by the presence of typical whooping cough in the brother. Szegö described a laryngospastic stage, a reprise, associated with the attacks of sneezing but without the presence of paroxysmal coughing. I have not had this experience. He also noted the presence of coryza and the expulsion of a tenacious mucus at the end of the attack of sneezing. Up to ten sneezes were counted in an expiratory phase. There was a maximum of twenty-two seizures in twenty-four hours. As bronchitis was present, there must have been an accompanying unspecific cough.

Filatow[3] gives what may be the first observation of this symptom. Henri Roger, a Frenchman, in a voluminous discussion on pertussis, published in 1883, described the condition in a few words. "I have seen several children who instead of attacks of cough have been seized with attacks of paroxysmal coryza" (au lieu de la toux quinteuse, étaient pris de coryza convulsiv). The sneezing was repeated at regular intervals once or twice in an hour, and after the last sneeze a copious mucus, analogous to that seen in whooping cough, was expelled through the nose. Roger saw two patients in whom this symptom occurred intermittently with typical coughing attacks.

A further search through the literature revealed nothing in Feer's textbook or in his "Diagnostik," nor in the textbooks of Finkelstein, Heubner, Holt, Morse, Abt, Strümpell and Ker. Henoch[4] described a child, aged 2 years, in whom the paroxysmal cough started and ended with paroxysms of sneezing. He recognized the existence of Roger's syndrome but had never seen just such a case. Kassowitz[5] says that pertussis may show only an irritative cough ("Hustenreiz"), which may be supplanted by paroxysmal sneezing. He believes that this is very rare. Seitz[6] says: "Particularly in younger children the attacks of coughing may end in convulsive sneezing, which may moreover take the place of the paroxysms of coughing." The observation of Seitz that this odd symptom of pertussis appears usually in younger children is borne out by the literature. Szegö's patient was 3 years old; Roger's patients were 21 months old and "a small boy"; Henoch's patient was 2 years old, and ours were aged 2 months and 16 months, respectively. In 1925, Meyer and Burghard[7] reported 1,064 cases of pertussis. In young infants, spasmodic sneezing was infrequently seen not only as the initial stage of the cough but also as an equivalent of the latter. They also observed spasmodic yawning.

1. Griffith: Diseases of Infants and Children, Philadelphia, W. B. Saunders Company **1**, 1927.
2. Szegö: Arch. f. Kinderh. **29**: 186, 1900.
3. Filatow, quoted by Szegö (footnote 2).
4. Henoch: Vorlesungen ü. Kinder-Krankheiten, Berlin, A. Hinochwald, 1903, p. 431.
5. Kassowitz: Praktische Kinderheilkunde, 1910.
6. Seitz: Kinderheilkunde, Berlin, S. Karger, 1910, p. 203.
7. Meyer, S., and Burghard, E.: Ztschr. f. Kinderh. **40**: 103, 1925.

CONCLUSION

Sneezing, if of a paroxysmal nature, may be of great value in diagnosis as an early symptom of pertussis. In young children the sneezing may supplant the cough entirely or partially. The attacks are typically convulsive, cause congestion of the head, cyanosis and exhaustion, and may end in the expulsion of the usual tenacious mucus through the mouth and the nose as in the cough attacks. They may be accompanied by a coryza, an inspiratory crow and vomiting. The few cases seen by us or described in the literature have been moderately severe but not fatal.

RAYNAUD'S DISEASE OF THE UPPER EXTREMITIES

SUCCESSFUL TREATMENT BY RESECTION OF THE SYMPATHETIC CERVICOTHORACIC AND SECOND THORACIC GANGLIONS AND THE INTERVENING TRUNK *

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AND
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It has been demonstrated conclusively that permanent vasomotor changes result from lumbar sympathetic ganglionectomy and ramisectomy. These changes consist in increased circulation of blood in the feet with resulting increase in surface temperature. Other permanent changes in the feet that follow operation on the lumbar sympathetics are the disappearance of sweating and loss of the pilomotor reflex.

The temperature change following ramisectomy was observed first by Royle,[1] was demonstrated later by us,[2]

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1. Royle, N. D.: A New Operative Procedure in the Treatment of Spastic Paralysis and Its Experimental Basis, M. J. Australia **1**: 77-86 (Jan. 26) 1924; The Surgical Treatment of Raynaud's Disease and Similar Conditions, ibid., supp. 11, pp. 341-343, Nov. 5, 1927.
2. Adson, A. W.: Ramisection for Spastic Paralysis, S. Clin. North America **5**: 777-789 (June) 1925; Surgical Relief of Raynaud's Disease and Other Vascular Disturbances by Sympathetic Ganglionectomy and Perivascular Neurectomy, Ann. Clin. Med. **5**: 161-167 (Aug.) 1926. Adson, A. W., and Brown, G. E.: Treatment of Raynaud's Disease by Lumbar Ramisection and Ganglionectomy, and Perivascular Sympathetic Neurectomy of the Common Iliacs, J. A. M. A. **84**: 1908-1910 (June 20) 1925; Calorimetric Studies of the Extremities Following Lumbar Sympathetic Ramisection and Ganglionectomy, Am. J. M. Sc. **170**: 232-240 (Aug.) 1925. Brown, G. E.: Three Cases of Vascular Disease Affecting the Feet: Thromboangiitis Obliterans, Raynaud's Disease, and Erythromelalgia, M. Clin. North America **8**: 1189-1202 (Jan.) 1925; The Skin Capillaries in Raynaud's Disease, Arch. Int. Med. **35**: 56-73 (Jan.) 1925; Physiologic Studies on the Vasomotor Changes After Lumbar Sympathetic Ganglionectomy and Perivascular Neurectomy, Ann. Clin. Med. **5**: 168-175 (Aug.) 1926. Brown, G. E., and Rowntree, L. G.: Vasodilatation Following Sympathetic Neurectomy, Am. Heart J. **1**: 144-150 (Dec.) 1925. Rowntree, L. G., and Adson, A. W.: Bilateral Lumbar Sympathetic Ganglionectomy and Ramisectomy for Polyarthritis of the Lower Extremities, J. A. M. A. **88**: 694-696 (March 5) 1927.

and was proved conclusively by accurate quantitative measurements. Our first studies were made on patients with spastic paralysis of cerebral origin, who were operated on with a view to relieving the spasticity. The results of operation on such patients will not be discussed here, as the demonstration of marked vasodilatation following this procedure led us to apply the operation in diseases accompanied by vasoconstriction.

To substantiate our argument as to the permanence of temperature changes, we refer to our previous articles. Our first transperitoneal bilateral lumbar sympathetic ganglionectomy for spastic paralysis was performed, May 20, 1924, and it was applied to Raynaud's disease of the lower extremities, March 19, 1925. More than three years has passed since operation on many of the patients, and the same vasomotor changes are present today that occurred immediately following the operation.

Since we had been successful in the treatment of Raynaud's disease of the lower extremities and also in the relief of vasomotor spasm when superimposed on the collateral vessels in cases of thrombo-angiitis obliterans, we sought to relieve similar disturbances of the upper extremities. Therefore we carried out several procedures, with partial success and partial failure, until the present one gave us a result exactly similar to that which we and the others—Davis and Kanavel,[3] Diez,[4] Royle[1] and Fulton[5]—had attained by lumbar sympathetic ganglionectomy and ramisectomy.

The earlier procedures were as follows: March 2, 1925, we removed the left cervical chain, including the superior cervical ganglion and the middle and cervicothoracic ganglions, according to a modified technic of Jonnesco.[6] The results were only partially successful. On a second attempt, we combined the Jonnesco operation (removal of the middle cervical and cervicothoracic ganglions) with the Royle ramisectomy, attempting to make sure that all rami to the brachial plexus were divided. The results were no better than with the first operation. Subsequently, we carried out a Leriche[7] operation (perivascular neurectomy) on the axillary and the upper brachial arteries in the same patient, without success.

After these experiences we were convinced that we had failed to interrupt all of the gray rami to the vessels of the upper extremity. We then proceeded to develop an operation that would permit resection of the second dorsal and the cervicothoracic sympathetic ganglions in addition to removing the intervening sympathetic trunk.

ANATOMY

Ranson[8] stated that the cervical trunk is composed exclusively of preganglionic efferent fibers, which are derived through the white rami from the upper thoracic nerves and ascend to terminate in the cervical sympathetic ganglions. He stated further that the white rami contain both afferent and efferent fibers. The efferent fibers are preganglionic; the afferent fibers are probably sensory-cerebrospinal fibers. This fact may be significant in explaining the disappearance of pain in the extremities or in the region of the heart following interruption of postganglionic fibers. The gray rami are postganglionic. Gray[9] stated that the superior cervical ganglions send gray rami to the first, second, third and fourth cervical spinal nerves. The middle cervical ganglions or plexuses send gray rami to the fifth, sixth and seventh cervical spinal nerves. The lower cervical ganglions send gray rami to the seventh and eighth cervical spinal nerves and to the first thoracic spinal nerve. The first thoracic ganglion sends gray rami to the first thoracic spinal nerve and to the lower cervical ganglions. Nothing definite is said about the second thoracic ganglion except to indicate that it is in the chain and that all thoracic sympathetic ganglions receive one white ramus and give off one gray ramus to the corresponding spinal root.

Pitres and Testut[10] concur with Gray but state only that the cervicothoracic sends gray rami to the seventh and eighth cervical spinal nerves and to the first thoracic spinal nerve. However, they add the note that the second thoracic sympathetic ganglion sends gray rami to the first as well as to the second thoracic spinal nerves. Kuntz[11] has contributed the best discussion on the anatomy of the cervical and upper thoracic sympathetic nerves and stresses the point that the second intrathoracic ramus contributes, in a large percentage of cases, to the first thoracic spinal nerve. Since the first thoracic spinal nerve contributes largely to both the median and the ulnar nerves, which contain gray rami from the second thoracic ganglion and from the cervicothoracic ganglion, it is obvious that these sympathetic fibers must be divided if a complete result is to be obtained.

By the anterior Jonnesco approach the surgeon is likely to fail, since the lower cervical ganglion, even though it usually is attached closely to the thoracic ganglion by a broad band, often is lobulated. This leads the surgeon to believe that he has removed the whole of the cervicothoracic ganglion, when he has removed only the upper part, leaving the thoracic portion of the ganglion to send gray rami to the seventh and eighth cervical spinal nerves and to the first thoracic spinal nerve. At other times, the anterior approach does not offer sufficient exposure to permit complete removal, and, again, Kuntz says that the second thoracic sympathetic ganglion may fuse with the first, which makes the anterior approach not practical. It is obvious that when successful removal of the cervicothoracic ganglion has been effected, the cervical and thoracic ganglions are thoroughly fused and are placed high in the thoracic inlet. The present anterior approach, with the supposed removal of the stellate ganglion, has not produced the same vasodilatation in Raynaud's disease in the upper extremities that has been accomplished by lumbar sympathetic ganglionectomy and ramisectomy in the lower extremities. This indicates that gray rami are entering the lower trunk of the brachial plexuses.

Kramer and Todd[12] stated that the subclavian and axillary arteries receive their nerve supplies directly from the sympathetic chain; the brachial artery, from

3. Davis, Loyal; and Kanavel, A. B.: The Effect of Sympathectomy on Spastic Paralysis of the Extremities, J. A. M. A. **86**: 1890-1893 (June 19) 1926.
4. Diez, J.: El tratamiento de las afecciones tróficas y gangrenosas de los miembros por la resección de las cadenas cérvico-torácica y lumbosacra del simpático, Prénsa méd. argent. **12**: 377-403, 1925-1926.
5. Fulton, J. F.: Vasomotor and Reflex Sequelae of Unilateral Cervical and Lumbar Ramisectomy in a Case of Raynaud's Disease, with Observations on Tonus, Ann. Surg. **88**: 827-841, 1928.
6. Jonnesco, Thomas: Traitement chirurgical de l'angine de poitrine par la résection du sympathique cervico-thoracique, Presse méd. **29**: 193-194 (March 9) 1921.
7. Leriche, Réné: De la sympathectomie péri-artérielle et de ses résultats, Presse méd. **25**: 513-515 (Sept. 10) 1917.
8. Ranson, S. W.: Anatomy of the Sympathetic Nervous System with Reference to Sympathectomy and Ramisection, J. A. M. A. **86**: 1886-1893 (June 19) 1926.
9. Gray, Henry: Anatomy, Descriptive and Applied, ed. 21, Philadelphia, Lea & Febiger, 1924, p. 1417.
10. Pitres, Albert; and Testut, L.: Les nerfs en schémas, Paris, O. Doin, 1925.
11. Kuntz, Albert: Distribution of the Sympathetic Rami to the Brachial Plexus: Its Relation to Sympathectomy Affecting the Upper Extremity, Arch. Surg. **15**: 871-877 (Dec.) 1927.
12. Kramer, J. G., and Todd, T. W.: The Distribution of Nerves to the Arteries of the Arm, with a Discussion of the Clinical Value of Results, Anat. Rec. **8**: 243-255, 1914.

the musculocutaneous nerve; the radial artery, from the musculocutaneous nerve but chiefly from the radial; the ulnar artery, from the ulnar nerve, and the dorsal interosseous artery, from the dorsal interosseous nerve (deep ramus of the radial). In other words, the distribution of the nerves to vessels corresponds roughly with the distribution of nerves to the muscles and skin.

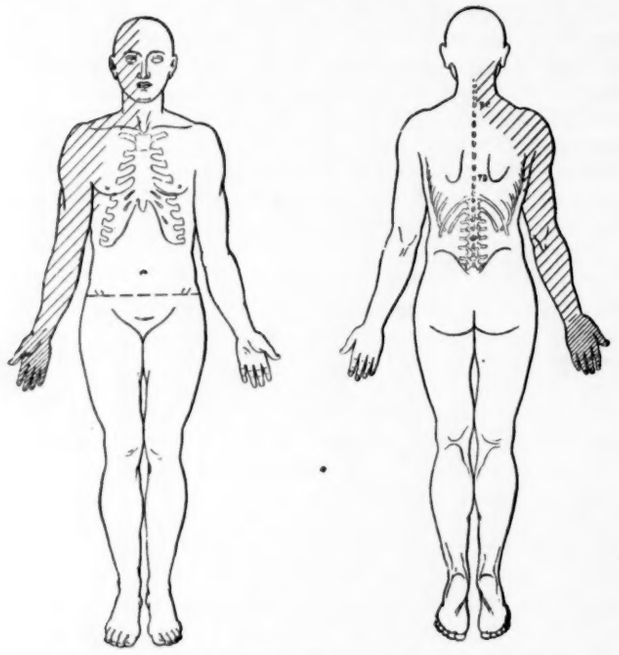

Fig. 1.—Shaded portion indicates the area of disappearance of sweating with increased environmental temperature, following the removal of the right cervicodorsal and second dorsal ganglions.

The problem that confronted us was to find a procedure that would permit complete removal of the second dorsal and cervicothoracic sympathetic ganglions, and the intervening trunk, in order to break completely all sympathetic impulses to the subclavian and axillary arteries and to the brachial plexus. It appeared that the posterior approach was the logical procedure, and in groping about in medical literature for information concerning the exact anatomy of this field, our attention was called to Henry's monograph on "Exposure of Long Bones and Other Surgical Methods."[13] This work contained an essay on an anatomic dissection of the cervicodorsal ganglion, from the posterior approach, under the title "A New Method of Resecting the Left Cervicodorsal Ganglion of the Sympathetic in Angina Pectoris.[14] This evidence convinced us that it was possible to remove the second thoracic ganglion, the cervicothoracic ganglion and the intervening sympathetic trunk, a procedure employed in the case we are about to report. The procedure was divided into two operations: resection of the second thoracic sympathetic ganglion, the cervicothoracic ganglion and the intervening sympathetic trunk on the right side, July 31, 1928, and a similar operation on the left side, Sept. 11, 1928.

REPORT OF CASE

History.—A woman, aged 25, came to the clinic, July 23, 1928, because of color disturbances with associated pain in the hands and feet, which had first been noticed three years before when late in the fall blanching of the index finger of the right hand had occurred with subjective sensations of numbness. These symptoms disappeared completely during the following summer. In the second winter all the fingers of both hands, to the metacarpophalangeal joints, became affected; there was numbness and dull aching, but complete recovery took place when environmental temperatures became elevated. In the third winter the condition became more pronounced. Following exposure to cold, the fingers became markedly cyanotic, and when the temperature dropped still further vasomotor spasm was induced. The process now involved the feet. Dull aching pain occurred during the stage of cyanosis, and for the past three months the tip of the right index finger had become permanently cyanosed, with beginning loss of tissue.

Examination.—The systolic blood pressure was 120, and the diastolic 70 mm. of mercury. The patient was thin and of asthenic build. Examination of the hands, on a warm summer day, showed diffuse puffiness and marked sweating, with moderate cyanosis. It was impossible for the patient to close the hands completely. The tip of the right index finger was deeply cyanosed and a small dry ulcer was present. In the warm bath there was incomplete disappearance of the cyanosis. The hands were cold and clammy. With greater degrees of cold the cyanosis became more intense, and the hands became inky-black to the wrists. In the feet the reaction was similar but less intense. When the patient was put in the heating chamber, the hands and feet became intensely red, hot and swollen, with profuse sweating. This was accompanied by marked subjective symptoms of burning pain, almost unbearable to the patient. The general examination did not show evidence of cervical ribs or any organic factors to explain the condition. The neurologic examination did not show organic changes in the nervous system. The palpable vessels of the hands and feet pulsated and perhaps were slightly diminished in magnitude. The diagnosis was vasomotor neurosis of the spastic type involving the four extremities, or Raynaud's disease. It was believed best to attempt removal of the dorsal ganglions on one side only in order to permit the opposite hand to serve as a control for the subsequent studies. The patient was operated on, July 31.

Since the object of the operation was to remove the cervicothoracic ganglion, the second thoracic ganglion and the intervening trunk by a dorsal approach the patient was placed in the prone position. Ether anesthesia was used. Henry referred to several landmarks which he employed in conjunction with skin and muscle flaps, but since we proposed to perform a second operation, on the opposite side, the flaps suggested could not be employed conveniently. We used a hockey-stick incision over the upper dorsal and lower cervical regions on the right side, carrying the curved tip of the incision to the right of

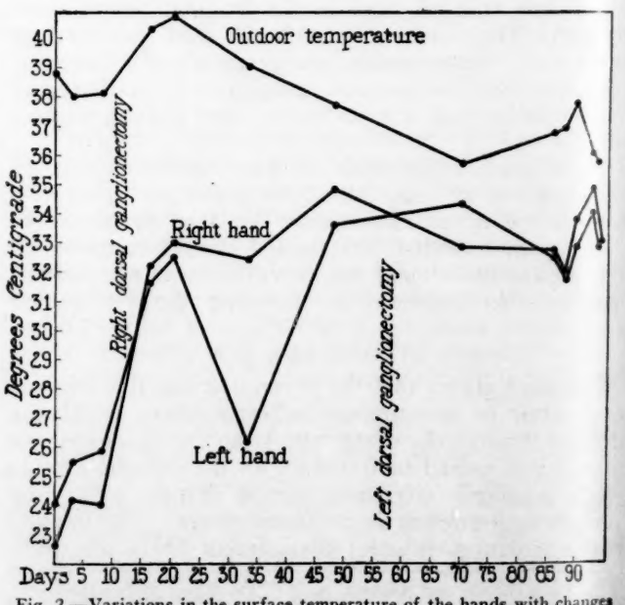

Fig. 2.—Variations in the surface temperature of the hands with changes in the environmental temperature. Following operation, the surface temperatures remain fairly constant and high.

13. Henry, A. K.: Exposures of Long Bones and Other Surgical Methods, New York, William Wood & Co., 1927.
14. Henry, A. K.: A New Method of Resecting the Left Cervicodorsal Ganglion of the Sympathetic in Angina Pectoris, Irish J. M. Sc. 5: 157-167 (April) 1924.

the median line over the trapezius; a median line incision was employed for the operative procedure on the left dorsal ganglions. Since these two operations were performed, we have performed bilateral dorsal ganglionectomy through a median line incision. The method was as follows:

Method of Operating.—The patient was placed prone on two soft pillows, and the arms were permitted to hang down over the edge of the table in order that the scapula might be retracted outward and forward. The neck was flexed forward and the head was supported by an Adson-Little cerebellar head rest. Ether was administered by the inhalation method, through an open mask attached to the head rest. The incision in the skin was made in the median line, from the tip of the spine of the sixth cervical vertebra to the tip of the spine of the fourth dorsal vertebra. The incision was carried down to the spinous processes, the fascia over the trapezius being exposed on both sides. A fascia-muscle incision was made on each side, parallel with the spinous processes and extending from the seventh cervical vertebra to the fourth dorsal vertebra. The procedure at this point was carried to completion on the side that was to be operated on, before the muscular dissection on the opposite side was done. The fascia-muscle incision was made first through the tendinous attachment of the trapezius to the spinous processes and subsequently through the spinous attachment of the rhomboids and serratus posterior. A retractor was then used to expose the erector spinae group of muscles and the lower end of the splenius cervicis. The transverse processes of the dorsal vertebrae could be palpated through these muscles, and the spinous process, as well as the tip of the transverse process of the second dorsal vertebra, should be identified. Blunt dissection was made through the erector spinae group, parallel with the spinous processes. The retractor was replaced at a deeper level and opposite the transverse process of the second dorsal vertebra. Muscular attachments to the transverse process were now freed in a mesial direction until the process could be demonstrated where it fused with the body and the lamina of the vertebra. The periosteum of the rib was incised on the dorsal aspect, permitting exposure of the rib lateral to the transverse process for a distance of 3 cm. Then the rib was cut at the outer border of this exposed area and, mesially, rib and transverse process were removed as far as to the body of the vertebra. Occasionally there was difficulty with the intercostal artery, but this was ligated, care being taken not to injure the first or second thoracic nerves. The pleura and lung now were dissected gently from the lateral side of the vertebra and were retracted anteriorly and laterally. This procedure exposed the sympathetic trunk, between the second thoracic and the cervicothoracic sympathetic ganglions, at a level corresponding to the articulation of the head of the second rib. After the sympathetic trunk had been exposed, the procedure consisted in the dissection and removal of these ganglions and the intervening trunk, the elevation and resection of the second thoracic ganglions and the division of any gray rami that may run laterally from the second thoracic ganglion to the first thoracic nerve. The second thoracic ganglion having been elevated and the sympathetic trunk divided below it, retraction was made from above downward, the cervicothoracic ganglion being exposed. This was done by first dividing the ansa subclavian ramus, with subsequent division of the rami as they pass off to the first thoracic spinal nerve. Gradual mobilization of the ganglions was permitted in this way, and finally it was possible to retract the ganglion sufficiently to divide all of the rami ascending into the cervical region.

That the anatomy of the cervical and thoracic ganglions is not constant has been verified by our surgical procedures. The one disturbing factor in this particular case is that on the right side there developed an incomplete Horner's syndrome which gradually has improved; on the left side, the Horner's syndrome was more or less complete and failed to improve to the same degree as that on the right. The difference between the sympathetic ganglions on the two sides is as follows: On the right side the second dorsal and a definitely circumscribed ganglion (believed to be the cervicothoracic) were removed, the rami being divided above the ganglion without any evidence of a lower cervical ganglion being situated above. On the left side, after we had removed the second thoracic, we exposed what we thought to be the cervicothoracic; however, it proved apparently to be only the first thoracic, as gentle retraction brought into view the lower cervical ganglion. It is possible, of course, that the lower cervical ganglion on the right side was not removed, and that the ganglion still received efferent sympathetic innervation; at all events the procedure on the right side, as well as that on the left side, produced the desired physiologic effects in the hands, with relief of the symptoms produced by the vasomotor spasm commonly known as Raynaud's disease.

Surface Temperature of Hands Before and After Right and Left Ganglionectomy for Raynaud's Disease

Date	Outdoor Temperature, C.	Room Temperature, C.	Surface Temperature, C. Right Hand: Index Finger	Right Hand: Third Finger	Right Hand: Dorsum	Right Hand: Palm	Left Hand: Index Finger	Left Hand: Third Finger	Left Hand: Dorsum	Left Hand: Palm	Comment
7/20/28	26.1	24.0	22.7	23.2	24.1	....	24.1	24.3	25.2	....	Hands cold, swollen and markedly cyanotic
7/24/28	21.1	21.5	24.2	24.9	25.8	....	25.5	25.3	27.0	....	Marked cyanosis
7/28/28	22.2	21.5	24.0	25.0	24.0	....	25.9	27.7	29.0	....	Marked cyanosis
7/31/28	....	....	....	....	....	....	....	....	....	....	Right dorsal ganglionectomy
8/ 4/28	34.4	26.0	32.3	33.1	33.8	....	31.7	32.6	34.5	....	
8/ 7/28	36.7	27.0	33.1	31.4	34.7	....	32.6	30.9	35.0	....	
8/20/28	26.7	22.5	32.5	34.7	32.3	....	26.2	25.9	28.9	....	Right hand warm, dry and of normal color; left hand cyanotic, cold
9/ 3/28	20.0	23.5	34.9	34.4	32.0	....	33.7	31.8	29.3	....	Both hands warm; left dry
9/ 5/28	20.0	22.0	....	....	....	33.6	....	....	....	24.4	
9/ 9/28	....	....	....	....	....	....	....	....	....	....	Left dorsal ganglionectomy
9/25/28	8.9	23.0	32.9	34.7	....	34.9	34.4	34.4	34.7	....	
10/11/28	13.3	22.5	32.8	31.0	31.0	31.2	32.6	32.3	30.9	32.5	Both hands of normal color and dry
10/13/28	14.4	22.5	32.0	32.2	31.7	32.4	31.8	32.3	30.7	31.5	Weather rainy and cold; feet cyanotic
10/15/28	20.0	20.3	33.8	34.0	33.1	35.2	32.9	33.1	31.9	35.1	Hands dry and warm
10/17/28	10.0	22.0	34.9	34.9	33.9	36.1	34.1	34.2	33.1	35.3	
10/18/28	8.9	21.0	33.0	32.6	31.8	33.6	32.9	32.6	32.1	33.5	Hands normal
11/12/28	2.2	19.9	28.1	29.5	29.4	30.0	27.5	28.5	30.0	30.3	Body exposed in cold room; no color change in hand

Effects of Operation.—The day following the operation on the right side it was noted that both hands were warm. In the hand on the side on which operation was performed, not only was the temperature increased but the skin was excessively dry, to a degree to be noticed subjectively by the patient. Since the hand on the side not operated on did not show vasomotor spasms following the shock of operation and the warm temperature of the room, it was impossible to determine the variation in temperature between the two sides until the patient had left the hospital and was exposed to lower environmental temperatures. The first complete studies on the surface temperature were carried out three weeks after operation.

Sweating was absent from the right side of the face, from the chest down to a level 10 cm. below the clavicle anteriorly, and to the level of the fifth dorsal vertebra posteriorly, and from the armpit and entire right arm. The driest area noted was the right hand. Sweating could not be induced with sharp increases in the environmental temperature but was definitely demonstrable following the administration of pilocarpine (fig. 1). Following the operation, the right pupil was contracted and there was slight enophthalmos. Three weeks later, examination of the eye showed that a true or complete Horner's syndrome was not present, as the pupil could be dilated with cocaine. The enophthalmos had entirely disappeared. There was absence of pilomotor responses in the right forearm. The

right hand was pink and dry and warm at all times. Cyanosis or pallor could not be induced by changes in the room temperature. The left hand, on the side which was not operated on, when subjected to conditions similar to those in which the right hand was placed, was cyanotic, cold and moist, and showed

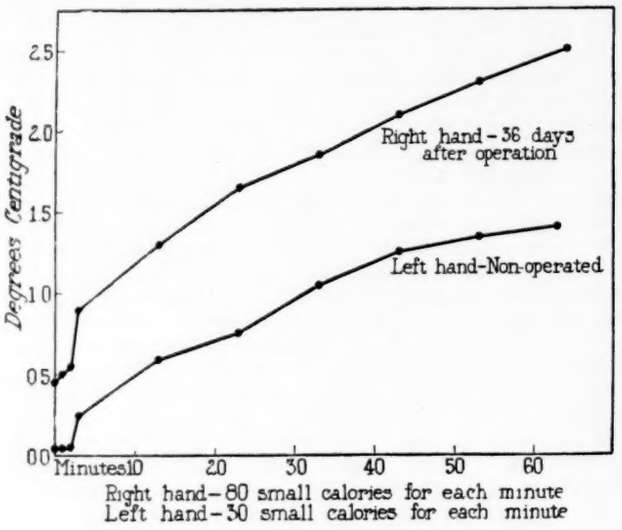

Fig. 3.—Rate of heat elimination in small calories as measured by the hand calorimeter.

sharp fluctuations in color and surface temperature, depending on the environmental temperature. Demonstrable changes were not noted in the radial pulse of the two sides. The accelerator response of the heart to exercise was normal.

The surface temperatures of the hands are shown in the accompanying table under varying degrees of environmental temperature. It will be noted that whereas the surface temperature of the hand on the side on which operation was performed was constant, that of the other hand, the left, fluctuated, varying from 21 to 32 C. (69.8 to 89.6 F.), as shown in figure 2.

Calorimetric studies to determine the rate of heat elimination or the rate of the volume blood flow were carried out on both hands (fig. 3). There was an increase of approximately 370 per cent in the amount of heat eliminated in the hand of the side on which operation was performed as compared with that of the control hand. Repeated determinations showed this effect to be constant.

Examination of the capillaries of the nail-fold on the hand of the side on which operation was not performed showed the large, dilated atonic loops so characteristic of fairly advanced Raynaud's disease. The capillary blood flowed extremely slowly or was static, giving a broken appearance to the loop, and the blood was blue. On the side on which operation had been performed there was a smaller number of capillary loops for each field, the flow was regular and the blood was bright red. The loops were narrower, indicating increased tonus (fig. 4).

The results in this case were so striking, so indicative of therapeutic success, that the patient was extremely anxious to have the operation repeated on the opposite side. Accordingly, Sept. 11, a similar operation was carried out on the opposite side. The day following the operation on the left side it was noted that the left pupil was contracted and there was definite enophthalmos. The disappearance of sweating involved the same distribution on the left side as on the right, although it was not so marked in the left armpit. The surface temperatures of the hands increased sharply and remained high, as shown in the table. There were no significant variations in these temperatures with reduced environmental temperatures.

In appearance, the left hand showed the same improvement as that noted in the right (fig. 5). The skin was dry and felt normal in every respect. The cyanosis and all abnormal color reactions disappeared, and the patient stated that the condition of her hands was more nearly normal than it ever had been. There was no impairment in the accelerator response of the heart following rapid ascents of three flights of stairs or after the standard exercise of twenty hops on one foot. The pulse increased to approximately 130 and, within two and a half minutes following the exertion, resumed its usual rate of 90. Examination of the left eye, three weeks after operation, indicated the presence of Horner's syndrome, and the enophthalmos had not entirely disappeared.

October 23, abdominal transperitoneal bilateral sympathetic ganglionectomy and ramisectomy was performed for the relief of the vasospastic disturbance in the feet. The second, third and fourth lumbar sympathetic ganglions, with the intervening trunk, were resected and all the rami to the second, third and fourth spinal lumbar nerves were divided. An uneventful convalescence followed. The clinical and physiologic effects of the operation were, as usual, most satisfactory. The surface temperature in the feet showed a maintained increase of approximately 8 degrees C., and there was an increase in the rate of heat elimination, as measured by the foot calorimeter, of approximately 500 per cent; this was measured in small calories of heat eliminated each minute for each square inch of surface area. The feet were dry and warm and the vasomotor reactions resulting from environmental cold disappeared. The patient was dismissed from observation, November 15, with complete relief of the Raynaud's disease in the four extremities.

SUMMARY

Observations over a period of 106 days after removal of the cervicothoracic and the second thoracic ganglions and intervening sympathetic trunk on the right side, and sixty-eight days after a similar operation was performed on the left side, indicated marked, maintained vasodilatation in the upper extremities and face. Vasomotor activity following fluctuations in the environmental temperature, as evidenced by color and temperature changes in the hands, practically disappeared. The color of the skin became normal; it was dry and the surface temperature was markedly elevated. Sweating was markedly diminished over both arms, over the upper part of the chest both anteriorly and posteriorly, and over the face. The physiologic studies gave ample quantitative data to verify the improvement in the clinical condition. The results obtained in the upper extremities by this procedure are comparable to those obtained with the removal of the lumbar sympathetic ganglions in the lower extremities. Failures following ramisectomy and partial ganglionectomy are due to incomplete division of vasoconstrictor fibers supplying the peripheral circulation of the extremities. Therefore, ganglionectomy, which necessitates sympathetic trunk section, has given these permanently sustained temperature increases when simple ramisectomy and partial ganglionectomy have given only temporary or incomplete permanent temperature changes. The lumbar operation, subsequently performed on this

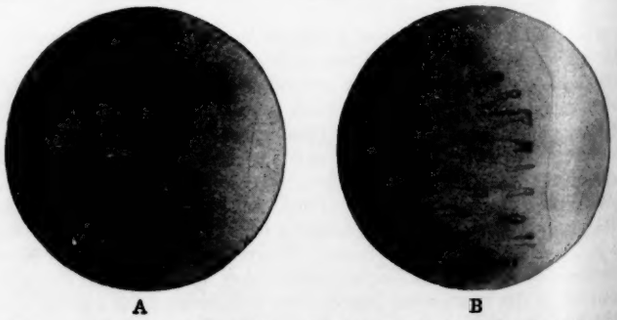

Fig. 4.—*A*, appearance of the capillaries of the nail-folds of the hand on the side on which operation was not performed. The dilated segmented appearance of the loops is apparent, and the subpapillary venules show as dark bands. *B*, appearance of capillaries on the hand of the side on which operation was performed. The capillaries are narrower and better defined, and the flow is regular and rapid; the subpapillary venules are not visible.

patient and here reported, was followed by the usual highly satisfactory results in vasodilatation of the feet. A similar operation subsequently carried out on another patient with Raynaud's disease involving the upper extremities has been shown to have had similar vaso-

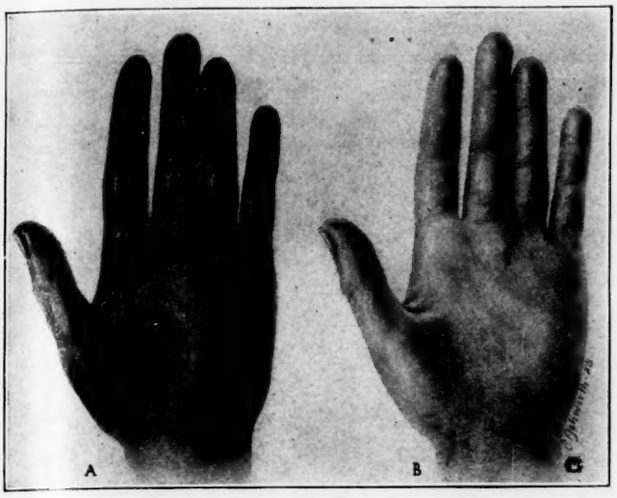

Fig. 5.—Left hand: *A*, before dorsal sympathetic ganglionectomy; *B*, following dorsal sympathetic ganglionectomy.

dilating effects. The studies in these two cases give ample reason to believe that the surgical control of Raynaud's disease is an accomplished fact.

AN EPIDEMIC OF TRICHINOSIS*

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In reviewing the literature on trichinosis, one finds that Teidemann, a German, in 1821, was the first to notice small bodies in the muscle; Peacock, an Englishman, in 1828, prepared the first specimen of *Trichinella*, which is still in Guy's Museum in London; Hilton, in 1832, was the first to suggest the parasitic origin of the disease, and Wormald, another Englishman, following Hilton's theory, supplied Owen with specimens containing the parasite from the anatomic laboratories. Owen and Paget, in 1835, were the first to discover the embryo; Herbst first transmitted the parasite by experiment. Virchow succeeded in isolating the adults; Leukhart first gave the life history of the parasite, and Zenker, in 1860, was the first to discover the disease-producing qualities of the parasites in a woman, aged 21, who was examined at autopsy. He found myriads of the parasites in the mucus of the gastro-intestinal tract. T. R. Brown in 1896 at Johns Hopkins, in the time of Osler, was the first to discover the eosinophilia that is so characteristic of the disease.

Our object in this paper is to present a report of one of the largest epidemics occurring in this country in recent years, rather than to offer something new either in the diagnosis or in the treatment of trichinosis. This epidemic has been most interesting both from the scientific and from the epidemiologic standpoints, because it could be followed through with thoroughness and studied in about forty-three patients. It presents even greater interest because, of these forty-three patients, we were able to study thirteen intensively in the hospital wards while thirty were studied as outpatients, and the medical department was fortunate enough to obtain a complete postmortem examination in one case resulting fatally from a complicating lobar pneumonia.

It seems unnecessary in this paper to define or to state the etiology and evolution of the disease; therefore we will confine ourselves to the historical facts of the epidemic, three or four clinical histories, and a pathologic report from the biopsies and postmortem examination held.

REPORT OF CASES

CASE 1.—J. S., a man, aged 31, a resident of Mechanicville, whose chief complaint was a persistent diarrhea, was admitted to the Albany Hospital, March 27, 1928. At the time of his admission the temperature, pulse and respirations were normal. The patient was a Spaniard and spoke very little English. It was almost impossible to obtain any history whatever, with the exception of the fact that he had suffered from this diarrheal condition for about four weeks and had been in an institution in northern New York for two weeks without improvement. Our first endeavor, after physical examination, was to rule out a typhoid or dysentery infection. The patient was rather undernourished, and apparently very weak. The skin was dry; the spleen was not palpable; no rose spots were manifest, and the pulse rate was relatively normal. Stool and urine examinations were made on the following day and blood was sent to the laboratory for a Widal test. The white blood cell count was 4,400. March 28, the stool was reported negative for the typhoid-dysentery group of organisms. Again, April 4, a negative report was obtained. Both of these reports were from the laboratory of the Albany Hospital. April 3, the Widal reaction was reported as positive. April 9, the laboratory of the New York State Department of Health reported the stools and urine negative for the typhoid-dysentery group of organisms.

CASE 2.—H. D., a man residing in Albany, was admitted, March 29, 1928, to the Albany Hospital because of generalized edema, especially about the eyelids, face, arms and legs, weakness and general malaise. The temperature was 100.8 F.; the pulse count was 100, and respirations were 30. This patient

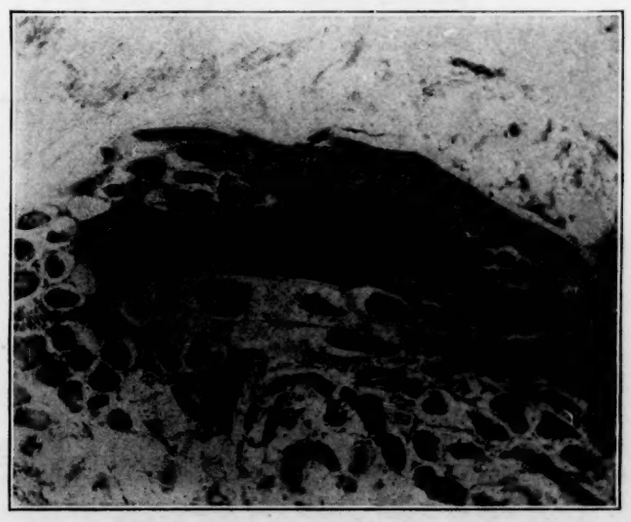

Fig. 1.—Section of deltoid muscle harpooned from one of the hospital patients for diagnosis, showing early inflammatory reaction around an encysting Trichinella spiralis and hyaline degeneration of muscle fibers.

was a Spaniard also, but spoke English more readily than did the previous one. He stated that ten days before admission he got up in the morning with a headache, soreness of the eyes and general malaise. The following day, the eyelids became swollen and generalized edema developed. Within twenty-four

* From the Medical and Pathological Services of the Albany Hospital and Albany Medical College.
* Read before the Twelfth Annual Meeting of the New York State Association of Public Health Laboratories, Albany, N. Y., May 21, 1928.

hours the edema developed to its maximum. He also complained of muscle tenderness and joint pains on motion. It was three days before the muscle tenderness subsided to any degree. The patient was not confined to bed and did not suffer any genito-urinary disturbance. In the next few days the edema did not wholly subside and he decided to come to the patient was questioned more carefully, we were able to obtain the information that he had eaten, among other foods, insufficiently cooked pork sausage a few days before his illness began. He also stated that five others had eaten of the same meat on the same occasion. A blood count showed a hemoglobin of 110 per cent; the red blood cells numbered 5,750,000 and the

*Clinical Data on Forty-Three Patients with Trichinosis**

Case	Sex†		Age	Chief Complaints	White Blood Count	Wassermann	Hemoglobin, per Cent	Red Blood Count	Differential Counts: Polymorphonuclears, per Cent	Lymphocytes, %	Mononuclears, %	Eosinophils, per Cent	Biopsy	Spinal Fluid	Stool	Urine	Blood Chemistry: Nonprotein Nitrogen	Blood Sugar	Creatinine	Temperature	Pulse	Respiration	Result
1	♂	O.P.	30	Headache, constipation, fatigue	.....	.....	...	.....	62	30	5	3	.....	.....	.....	.....	..	...	....	..	..	..	C
2	♀	O.P.	24	None	.....	.....	...	.....	51	24	13	12	.....	.....	.....	.....	..	...	....	..	..	..	C
3	♂	O.P.	33	Muscle-joint pain, headache	.....	.....	...	.....	53	17	4	26	.....	.....	.....	.....	..	...	....	..	..	..	C
4	♂	H.	24	Swollen face, muscle pain	7,000	Neg.	110	5,750,000	58	15	4	23	Showed T.S.	Neg.	No parasites	Neg. P.S.P. 54%	28	103	1.28	N	N	N	C
5	♂	O.P.	..	Muscle pain	19,160	.....	...	.....	44	10	5	41	.....	.....	.....	.....	..	...	....	..	..	..	C
6	♂	H.	42	Cough, abdominal pain, muscle pain	11,400	++++	87	4,840,000	23	22	3	32	.....	Neg.	No parasites	Neg.	48	100	....	N	N	N	C
7	♂	H.	27	Vomited, cough, fatigue	9,400	Neg.	78	4,000,000	14	2	51	34	.....	Neg.	Neg., no parasites	Neg.	31	97	1.66	N	N	N	C
8	♂	H.	28	Muscle pain, fatigue, diarrhea	11,600	Neg.	100	4,800,000	44	12	20	24	.....	Neg.	Neg., no parasites	Neg.	33	97	....	N	N	N	C
9	♂	O.P.	36	Vomited, cough, fatigue	.....	.....	...	.....	51	31	7	11	.....	.....	.....	.....	..	...	....	..	..	..	C
10	♂	O.P.	26	Boils, weakness	.....	.....	...	.....	66	18	6	10	.....	.....	.....	.....	..	...	....	..	..	..	C
11	♂	H.	27	Diarrhea, muscle pain, fatigue	18,200	Neg.	85	4,400,000	40	20	16	24	.....	Neg.	Positive blood	Neg.	39	97	....	N	N	N	C
12	♂	H.	28	Edema of face and body, muscle pain	11,500	Neg.	98	4,600,000	54	10	14	22	.....	Neg.	Neg., no parasites	Neg.	30	86	1.53	99.4	N	N	C
13	♂	H.	42	Edema of face, muscle pain	12,000	Neg.	90	4,040,000	68	13	11	8	Myositis	Neg.	Pos. blood, no parasites	Neg.	31	97	1.36	99.2	N	N	C
14	♂	H.	32	Edema of face, muscle pain	14,200	++++	90	4,700,000	54	10	10	26	Myositis	Neg.	Pos. blood, no parasites	Neg.	41	100	1.56	99	N	N	C
15	♀	O.P.	38	Muscle pain, tenderness	.....	.....	...	.....	30	25	9	36	.....	.....	.....	.....	..	...	....	..	..	..	C
16	♀	O.P.	13	Edema of face, muscle pain	.....	.....	...	.....	46	25	4	25	.....	.....	.....	.....	..	...	....	..	..	..	C
17	♂	H.	30	Muscle pain, pain in R. C. H.	18,000	Neg.	110	6,000,000	38	20	2	40	Myositis	Neg.	No parasites	Neg.	30	97	1.75	N	N	N	C
18	♂	H.	31	Diarrhea, fatigue	4,400	Neg.	80	.....	44	28	4	24	Myositis	Neg.	No parasites, pos. and neg. blood	Neg.	Widal positive			N	N	N	C
19	♂	H.	22	Cough, hoarseness, muscle pain, chills	4,840	Neg.	80	.....	51	23	9	17	Myositis	Neg.	Negative	.....	..	...	....	100.4	N	N	C
20	♀	O.P.	13	Diarrhea, cough	.....	.....	...	.....	46	19	5	30	.....	.....	.....	.....	..	...	....	..	..	..	C
21	♂	O.P.	8	Edema of face, diarrhea, pain	.....	.....	...	.....	45	28	4	23	.....	.....	.....	.....	..	...	....	..	..	..	C
22	♂	O.P.	15	Cough, malaise	.....	.....	...	.....	53	21	11	15	.....	.....	.....	.....	..	...	....	..	..	..	C
23	♀	O.P.	16	Cough, muscle pain, weak	.....	.....	...	.....	54	27	8	11	.....	.....	.....	.....	..	...	....	..	..	..	C
24	♀	O.P.	11	Edema of face, diarrhea, pain	.....	.....	...	.....	41	32	3.5	23.5	.....	.....	.....	.....	..	...	....	..	..	..	C
25	♀	H.	36	Severe pain in chest, myositis, pneumonia	18,400	Neg.	85	.....	92	0	7	0.5	Showed T.S.	.....	.....	Neg.	..	...	....	103	140–120	40	D
26	♂	H.	42	Marked muscle pain	12,000	Neg.	90	4,020,000	50	15	11	24	.....	Neg.	Negative	Neg.	29	93	1.26	N	N	N	C
27	♂	O.P.	..	No symptoms	.....	.....	...	.....	..	..	..	..	.....	.....	.....	.....	..	...	....	..	..	..	C
28	♂	O.P.	..	No symptoms	.....	.....	...	.....	..	..	..	..	.....	.....	.....	.....	..	...	....	..	..	..	C
29	♂	O.P.	27	General edema, muscle pain	.....	.....	...	.....	48	19	11	22	.....	.....	.....	.....	..	...	....	..	..	..	C
30	♂	O.P.	..	.....	.....	.....	...	.....	..	..	..	..	.....	.....	.....	.....	..	...	....	..	..	..	C
31	♂	O.P.	..	.....	.....	.....	...	.....	..	..	..	..	.....	.....	.....	.....	..	...	....	..	..	..	C
32	♂	O.P.	..	.....	.....	.....	...	.....	..	..	..	..	.....	.....	.....	.....	..	...	....	..	..	..	C
33	♂	O.P.	..	.....	.....	.....	...	.....	..	..	..	..	.....	.....	.....	.....	..	...	....	..	..	..	C
34	♂	O.P.	7	No symptoms	.....	.....	...	.....	28	27	12	33	.....	.....	.....	.....	..	...	....	..	..	..	C
35	♂	O.P.	11	No symptoms	.....	.....	...	.....	46	24	15	15	.....	.....	.....	.....	..	...	....	..	..	..	C
36	♀	O.P.	..	.....	.....	.....	...	.....	60	15	5	20	.....	.....	.....	.....	..	...	....	..	..	..	C
37	♀	O.P.	3	No symptoms	.....	.....	...	.....	57	30	8	3	.....	.....	.....	.....	..	...	....	..	..	..	C
38	♀	O.P.	4	No symptoms	.....	.....	...	.....	39	42	7	12	.....	.....	.....	.....	..	...	....	..	..	..	C
39	♀	O.P.	9	No symptoms	.....	.....	...	.....	30	25	10	35	.....	.....	.....	.....	..	...	....	..	..	..	C
40	♀	O.P.	29	Edema of face, muscle pain, fatigue	.....	.....	...	.....	52	13	3	32	.....	.....	.....	.....	..	...	....	..	..	..	C
41	♂	O.P.	..	Muscle pain	.....	.....	...	.....	58	16	7	19	.....	.....	.....	.....	..	...	....	..	..	..	C
42	♂	O.P.	..	Edema of face	.....	.....	...	.....	33	21	13	3	.....	.....	.....	.....	..	...	....	..	..	..	C
43	♂	O.P.	..	No symptoms	.....	.....	...	.....	..	..	..	..	.....	.....	.....	.....	..	...	....	..	..	..	..

* In the table O.P. and H. indicate outpatient and hospital patient; N, normal; R.C.H., right chest; P.S.P., phenolsulphonphthalein test. Results are given as C or D, indicating that the disease became chronic or that the patient died.

† In this column, ♂ indicates male; ♀, female.

hospital. Because of the facial edema, a specimen of urine was examined immediately. It showed a specific gravity of 1.023, was slightly cloudy and alkaline, and was negative for albumin and sugar; the microscopic examination also was negative. This seemed to rule out an acute nephritic condition. A phenolsulphonphthalein excretion test was done, which showed 54.2 per cent in two hours. This supported the ruling out of kidney infection as the cause for the edematous condition. When the white blood cells 7,000, with a differential count of 58 per cent neutrophils, 23 per cent eosinophils, 15 per cent lymphocytes, 3 per cent large mononuclears, and 1 per cent basophils. This, together with the history of having eaten uncooked pork, led to the investigation of the case as possibly one of trichinosis. A section of the deltoid muscle was excised and sent to the laboratory for study. It was reported to contain *Trichinella spiralis.*

SOURCE OF THE EPIDEMIC

Since patient 2 was a Spaniard and spoke English, we asked him to serve as an interpreter for patient 1, who had been admitted two days previously. The two patients proved to be acquaintances, and it was from this meeting that we were able to get in touch with and study this large series of cases.

Fig. 2.—A section of salt pork from the hog that caused the epidemic, showing encysted Trichinella spiralis.

We then obtained a history from patient 1 that he too, just previous to the onset of his illness, had eaten of insufficiently cooked or uncooked pork sausage and very shortly afterward colicky pains in the abdomen and the diarrhea had started. His blood count showed a leukopenia of 4,400; the differential count was 44 per cent neutrophils, 28 per cent lymphocytes, 24 per cent eosinophils, 2 per cent large mononuclears, and 2 per cent basophils. A harpooned section of muscle was sent to the laboratory for investigation.

On further investigation we were able to obtain the information that some time in the latter part of February, 1928, Mr. and Mrs. Y. of Albany, both Spaniards, went to Mechanicville for a visit. While there they purchased a pig from a butcher. This they brought back to Albany with them on their return. From the pork they made ordinary sausage containing garlic and peppers, and some blood sausage. They also kept some of the meat for bacon and salt pork. After the meat was prepared, a goodly portion was sent back to the Spanish colony in Mechanicville. Most of it, however, was kept at the home of Mr. and Mrs. Y. in Albany. Their home apparently was a boarding house, because at their residence a considerable number of people had eaten of this meat, which had been improperly or insufficiently cooked or not cooked at all. Several people in the Spanish colony at Mechanicville had also partaken of the meat. By tracing the persons who had eaten of this meat, we were able to get into communication with forty-three of them, thirteen of whom presented symptoms disabling enough to warrant their admission to the medical wards for more proper care; thirty others voluntarily came to the hospital to give more thorough histories, to permit physical examinations, and to have blood counts taken.

We were able to obtain from the home of Mr. and Mrs. Y. some of the meat that was left over. Part of this was examined in the laboratory of the Albany Hospital; the rest was sent to the New York state laboratory for examination. Both laboratories demonstrated *Trichinella spiralis* in the meat. Some of the meat was fed to rats. This completed our study of the cycle.

CASE 3.—April 3, 1928, Mrs. Y., who in company with her husband brought the pork back from Mechanicville, was admitted to the Albany Hospital with a temperature of 103 F., a pulse rate of 148, and a respiration rate of 35. On physical examination the patient showed evidence of right-sided lobar pneumonia. She had definite muscle tenderness, and joint pains on motion. She was cyanotic and dyspneic, and had an irritative cough; in short, she appeared critically ill. The white blood cells numbered 18,400, with a differential count of 92 per cent neutrophils, 5 per cent endothelial leukocytes, 2 per cent basophils and 0.5 per cent eosinophils. It should be noted that this patient did not show any eosinophilia. Examination of the sputum showed many gram-positive diplococci (encapsulated), but no acid-fast bacilli were found. For the next two days the patient's temperature, pulse and respirations remained about the same. Rather than showing signs of improvement under the ordinary treatment for pneumonia, the patient gradually grew worse and died, April 7, four days after admission. Fortunately, we were able to obtain a postmortem examination. This will be described with the pathologic report.

CHARACTERISTIC FEATURES OF THE DISEASE

Some of the important factors in this entire series of forty-three cases are as follows: The ages of the patients range from 3 to 42 years. Altogether, forty-three patients were followed, thirteen of whom were admitted to the hospital, where an opportunity was given to study them intently; thirty patients were studied as outpatients. Of the patients examined, thirty-one, or 88 per cent, showed an increase in eosinophils; four, or 12 per cent, did not show any increase in eosinophils; in eight we were unable to get blood counts.

The highest eosinophilia in the series was 41 per cent. Seventy per cent of the patients on whom white blood cell counts were done showed a leukocytosis. In the thirteen patients in the hospital, the spinal fluid examinations did not reveal any embryos or adult worms, and the stool examinations were negative for parasites. Van Cott and Lintz[1] have reported the

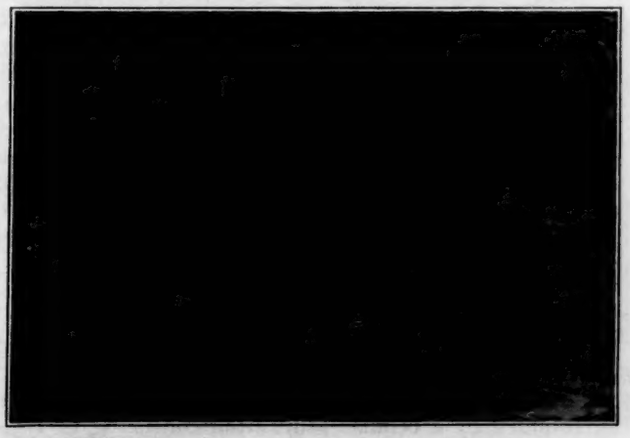

Fig. 3.—Section of heart showing focal acute myocarditis.

presence of the parasites in the spinal fluid, and Dr. C. K. Winne at the Albany Hospital demonstrated them also, in a patient sent in with a diagnosis of meningitis. Chemical tests of the blood were made in all thirteen admitted to the hospital; the only factor of

1. Van Cott and Lintz, in Report of the Association for Research of Nervous and Mental Diseases, 1926.

importance in the chemical analysis of the blood was that the blood sugar was relatively low.

The thirteen biopsies were performed by Dr. Waddell, who reported as follows:

The biopsy material consisted of deltoid muscle that was obtained in eleven cases. In five of these numerous

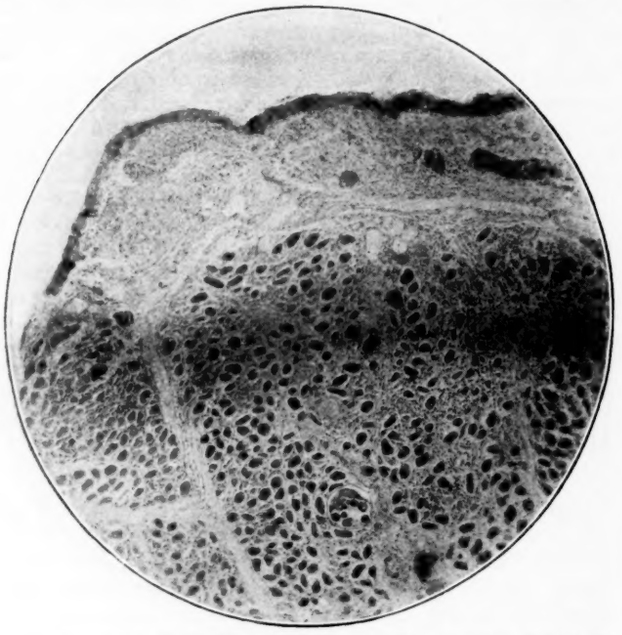

Fig. 4.—Section of diaphragm showing pleuritis, encysting Trichinella spiralis and focal acute myositis with hyaline degeneration.

larvae in different stages of encystment were found. In one, these were rare and brought out only by serial sections. In the last five no larvae could be demonstrated, only the focal myositis, which is characteristic of the disease, i. e., hyaline degeneration of the voluntary muscle fiber, the portion affected being surrounded by lymphocytes, endotheliocytes—these even invading the fiber—and a proportionately large number of eosinophils usually distributed around the periphery.

One patient died of a complicating lobar pneumonia in which a pneumococcus group IV was isolated from sputum ante mortem and from the lung post mortem. At necropsy, performed by Dr. Victor C. Jacobson, the right lung was most affected, the middle and lower lobes being entirely consolidated. Also the entire right pleural cavity was obliterated by a fibrinous pleurisy. The mucosa of the lesser intestines was very edematous and the mesenteric lymph nodes were enlarged and presented punctate hemorrhages. On close inspection, minute translucent bodies similar in appearance to renal glomeruli could be detected in the voluntary muscle.

Microscopically the lungs showed typical lobar pneumonia complicated by thrombosis of the pulmonary vessels with resulting infarctions. The heart presented many multiple foci of acute myocarditis, in which from one to six muscle fibers were undergoing degeneration, surrounded by a cellular infiltration consisting of lymphocytes, endotheliocytes and eosinophils. The liver, besides a marked fatty infiltration, also contained multiple focal necroses involving from three to ten cells, such areas being surrounded by the same cellular reaction noted in the heart. The mesenteric lymph nodes had partially lost their architecture, and the germinal centers were not numerous. Their blood vessels were markedly engorged and multiple minute hemorrhages had occurred, especially in the cortex. Voluntary muscles, such as the diaphragm, pectoralis major, rectus abdominis, psoas and gastrocnemius, were all heavily infested with encysting larvae. Other organs and tissues were not remarkable. The central nervous system was not examined.

The adult *Trichinella spiralis* was not discovered, and the larvae were found only within voluntary muscle fibers with one exception. In this case the embryo lay in the endomysium of a section of deltoid muscle and either was dead or dying, for surrounding it was an extraordinary fibrous reaction; hyperplastic fibroblasts laying down concentric sheets of collagen, of a loose texture, the disturbance occupying an area about 150 microns in diameter. The new tissue was infiltrated with a few lymphocytes and around the periphery were many eosinophils, together with lymphocytes and endotheliocytes.

The material gathered, including the pork incriminated as the source of the epidemic, gives a fairly consecutive picture of the larval encystment. The actual penetration of the muscle fiber was not seen, but living larvae lying full length within muscle fibers were studied in fresh teased out preparations. These were observed to move up and down the fiber but only for short distances, which may partially account for the hyaline degeneration often noticed extending considerable distances beyond the point of encystment. The fibrils in these early stages are disorganized, losing their striations, and coalesce into hyaline masses similar in appearance to Zenker's degeneration. Immediately surrounding the larva, however, the hyaline material is vacuolated and tends to disappear, suggesting digestion and liquefaction.

At this point the fiber is greatly swollen and soon is surrounded by an infiltration of leukocytes several cells in depth. Lymphocytes predominate, endotheliocytes

Fig. 5.—Encysting Trichinella spiralis in gastrocnemius muscle near tendon insertion from fatal case.

are numerous, and eosinophils are found in numbers around the periphery. At either pole of the encystment, the sarcolemma may be penetrated and endotheliocytes lie within the fiber, apparently taking up the hyalinized fibrils.

The muscle fiber nuclei are not destroyed but proliferate and attempt to reconstruct the disorganized fibrils as soon as the larva has curled up in the characteristic spiral and assumed the dormant state. Regeneration is complete and follows normal lines in those sections of

the fiber distant from the point of encystment, but in the immediate vicinity of the parasite the reaction is strikingly modified. The proliferated, enlarged, vesicular nuclei form in and around the spiral loops and seem to be concerned in the secretion of a uniform hyaline matrix filling an ovoid space and enclosing parasite and nuclei within its mass. This at first is basophilic and gradually as time passes becomes eosinophilic. Con-

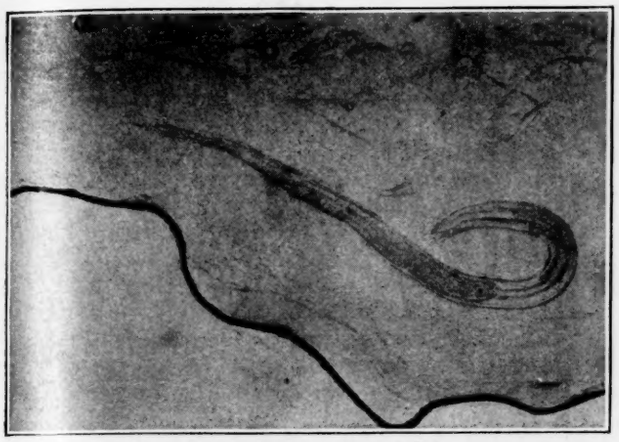

Fig. 6.—Trichinella spiralis larva in gastrocnemius muscle; fresh preparation from fatal case.

currently the outer zone condenses, forming first a more resistant pellicle which progressively thickens by internal accretions until it forms a hyaline, deeply eosinophilic acellular capsule from 5 to 10 microns in thickness. The enclosed matrix becomes rarefied and vacuolated, and the nuclei degenerate, becoming pyknotic and shrunken.

As the capsule forms, the inflammatory reaction subsides until only a rare leukocyte is found. Eosinophils are the last to disappear.

From the facts that nuclei of voluntary muscle lie within the substance from which the capsule is derived, that this substance undergoes changes in staining similar to regenerating muscle fibers and that after its formation the capsule is nonirritant, one deduces that the latter is derived from the muscle fiber itself.

Just what relation the lobar pneumonia had to the trichiniasis in the case that came to necropsy is not evident.

The presence of larvae in biopsy material is not essential in the diagnosis of trichiniasis, for the inflammatory reaction surrounding injured fibers is characteristic.

Serial sections will often bring out larvae in cases in which the infestation is only slight.

COMMENT

The predominating symptoms in the series of forty-three patients were: muscle and joint pains in twenty-two; edema of the face in nine; generalized edema in two; general fatigue in nine; cough in seven; severe headache in two; vomiting in two; chills in one; furuncles in one; marked hoarseness in one; lobar pneumonia in one, and bronchopneumonia in one. Eight of the patients did not present any symptoms.

The treatment should consist of rest in bed; the free administration of fluids; a high caloric diet, and 2 grains (0.13 Gm.) of mild mercurous chloride given in divided doses with a morning saline cathartic, to be repeated once after three days.

Colonic irrigations should be given together with such symptomatic treatment as may be indicated.

Clinical data should include a complete blood count; urinalysis; chemical analysis of the blood; stool and spinal fluid examinations, and biopsy of excised section of muscle.

CONCLUSIONS

1. The majority of cases show an eosinophilia with a relatively low percentage of neutrophils and a high percentage of lymphocytes and leukocytosis.
2. In patients with a complicating infection, such as pneumonia in our series, the blood picture may be markedly altered with an absence of eosinophilia.
3. With few exceptions, cases go on to chronicity.
4. All persons who eat of trichinous pork need not necessarily give clinical evidence of the disease.
5. Although patients with cerebral symptoms and signs may show the parasites in the spinal fluid, parasites are not consistently present.
6. No known remedy is specific. Drastic catharsis early in the infection is beneficial, as it aids in ridding the intestinal tract of parasites.
7. The blood sugar was low in all patients, which may be accounted for theoretically: either because of the presence of myositis, glycogen storage was impaired, or, because of muscle involvement, sugar consumption was increased.

REACTION OF THE THYROID GLAND TO INFECTIONS IN OTHER PARTS OF BODY*

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In previous publications we [1] have called attention to the production of hyperplastic changes in the thyroid gland of animals, accompanied by loss of colloid and desquamation of the epithelium of the acini, by systemic

Fig. 1.—Desquamation, loss of colloid, hyperplasia, and loss in iodine content in the thyroid gland as produced by injection of "loop toxin" which contained B. coli, proteins, B. welchii and hemolytic streptococci (see also figure 2). The animal was very ill when killed four days after the second injection.

infections and by toxemias. Although there does not appear to be any specific organism responsible for the

* From the Department of Surgery, Washington University School of Medicine, and the Barnes Hospital.
* Read before the Section on Surgery, General and Abdominal, at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

1. Cole, W. H., and Womack, N. A.: The Thyroid in Infections and Toxemias, Proc. Soc. Exper. Biol. & Med. **25**: 188, 1927; The Thyroid Gland in Infections, J. A. M. A. **90**: 1274 (April 21) 1928.

production of these changes, the fact remains that organisms belonging to the group inhabiting the intestinal tract are more prone, in our experience, to produce these changes than others. Concomitant with these observations we noted a marked decrease in the iodine content of the gland. Sokolow,[2] who reported in 1895 that pathologic changes were produced in the thyroid gland of patients with acute infectious diseases, was

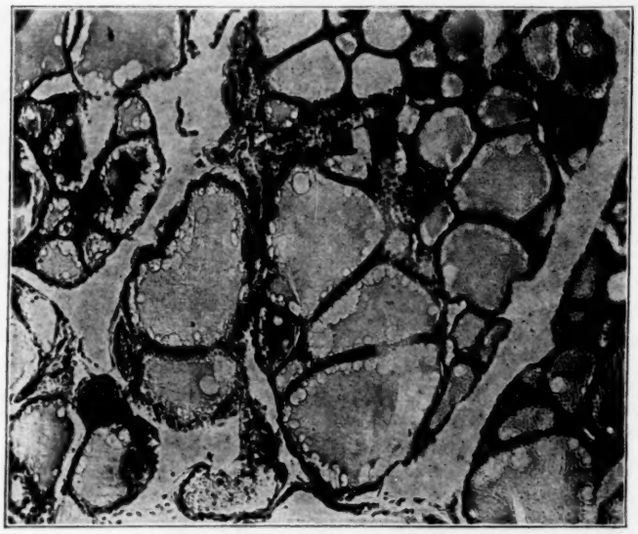

Fig. 2.—Thyroid gland of an animal receiving "loop toxin" as did the animal in figure 1, but to which iodine was given orally. Note that the gland has retained its normal characteristics without desquamation or loss of colloid. The animal was very ill when killed four days after the second injection.

probably the first to record them. Roger and Garnier[3] noted similar changes. Halsted[4] found that infected wounds in dogs were apt to produce a hyperplasia of the thyroid.

An enormous amount of work has been done in an endeavor to isolate the cause of endemic goiter. From extensive and valuable statistical data compiled by him, McClendon[5] feels that endemic goiter, and even goiter of the exophthalmic type, is caused by a lack of iodine in the food and water. We are inclined to agree with McCarrison,[6] however, in the assumption that another factor is necessary and is more important than the lack of iodine; namely, that the toxic effects of microorganisms exert a very prominent rôle in the production of simple goiter. Furthermore, McCarrison[7] cites an instance in his experiences in India in which an epidemic of goiter was eradicated by changing the water supply, whose iodine content was originally moderately high, to that with a low iodine content.

Recently, we[8] have observed that the same changes occurring in the thyroid of animals following infections occur in the human being but in a much smaller percentage of cases. Glands that were removed at autopsy and revealed hyperplasia, desquamation, and decrease in colloid and iodine content, were found to have occurred in patients who usually had succumbed to acute and serious infections. It should be stated, however, that not all the thyroids removed from patients dead from acute infections showed the changes mentioned. Not infrequently, hyperplasia of considerable amount will be encountered in the thyroids of persons killed in accidents. Occasional instances will be found in which the type of hyperplasia accompanying infections cannot be distinguished from the microscopic picture seen in exophthalmic goiter (fig. 3), as has also been observed by Marine and Lenhart.[9] Farrant[10] has conducted numerous experiments on guinea-pigs in an endeavor to determine what type of organism produces the most injury to the thyroid. He found that *B. diphtheriae, B. coli, B. mallei, B. anthracis, B. tetani, B. enteritidis* and the dysentery bacilli were more effective than any of the other organisms in the production of pathologic changes in the thyroid. In 1907, Vincent[11] called attention to the frequent occurrence of an enlargement of the thyroid during attacks of acute articular rheumatism. Of 186 patients examined by him, eighty-six had swelling and tenderness of the thyroid. A few developed exophthalmic goiter and a few hypothyroidism immediately after their acute illness. The possibility of the occurrence of hypothyroidism following the hyperplasia, desquamation and scarring seen so often accompanying periods of great stress (toxic or infectious) on the thyroid can readily be realized. Beck[12] has called attention to the frequency of foci of infection accompanying thyroid deficiency, and believes that coincidence cannot explain their frequent association.

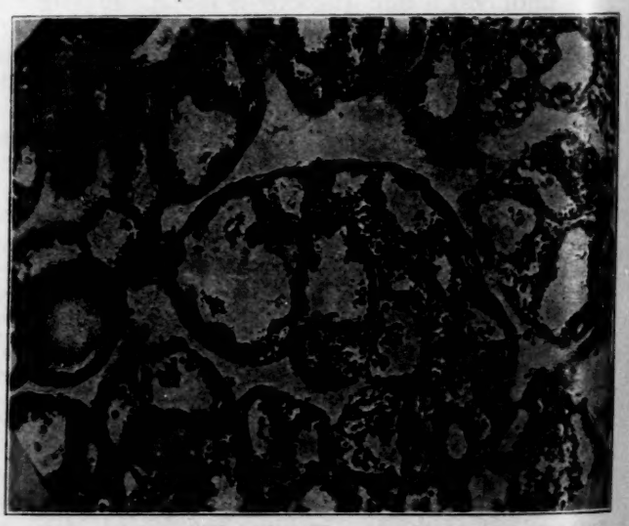

Fig. 3.—The hyperplasia in this section can scarcely be differentiated from that seen in the thyroid of a patient suffering from exophthalmic goiter without iodine therapy. A chronic infection of three weeks' duration was produced in this dog by an intentional contamination of a neck wound with fecal matter, and burial of a foreign body (piece of wood) within the depths of the wound.

Every one who has had experience with exophthalmic goiter has no doubt seen a number of patients

2. Sokolow, A. N.: Ueber Veränderungen der Schilddruse bei einigen akuten und chronischen Krankheiten, abstracted from the Russian in Virchow-Hirschs Jahresberichten **30:** 223, 1895.

3. Roger, H., and Garnier, M.: Le glande thyroide dans les maladies infectieuses, Compt. rend. Soc. de biol. **50:** 889, 1898.

4. Halsted, W. S.: Experimental Studies on the Thyroid Glands of Dogs, Johns Hopkins Hosp. Rep. **1:** 399, 1896; Reconsideration of the Question of Experimental Hypertrophy of the Thyroid Gland and the Effect of Excision of the Organ upon Other of the Ductless Glands, Am. J. M. Sc. **147:** 56, 1914.

5. McClendon, J. F.: Distribution of Iodine with Special Reference to Goiter, Physiol. Rev. **7:** 189, 1927. McClendon, J. F., and Hathaway, J. C.: Inverse Relation Between Iodine in Food and Drink, and Goiter, Simple and Exophthalmic, J. A. M. A. **82:** 1668 (May 24) 1924.

6. McCarrison, Robert: The Thyroid Gland, London, Baillière, Tindall & Cox, 1917; The Simple Goiters, London, Baillière, Tindall and Cox, 1928.

7. McCarrison, Robert: An Experiment in Goiter Prevention, Brit. M. J. **1:** 94 (Jan. 15) 1927.

8. Cole, W. H.; Womack, N. A., and Gray, S. H.: The Thyroid in Infections and Toxemias: Pathologic Changes in the Human Gland, read before the annual meeting of the American Association for the Study of Goiter, Denver, June 19, 1928.

9. Marine, David; and Lenhart, C. H.: Relation of Iodine to the Structure of Human Thyroids, Arch. Int. Med. **4:** 440 (Nov.) 1909.

10. Farrant, R.: The Pathological Changes of the Thyroid in Diseases, Brit. M. J. **1:** 470, 1914.

11. Vincent, M. H.: Rapports de la maladie de Basedow avec le rhumatisme aigu, Bull. et mém. Soc. méd. d. hôp. de Paris **24:** 1286, 1907.

12. Beck, H. G.: The Relation of Chronic Infection to Thyroid Deficiency, South. M. J. **11:** 492 (July) 1918.

develop the disease immediately after acute infections, especially those of the acute respiratory type. It is our opinion that this development of toxic goiter following infection is too frequent to be a coincidence. Billings [13] has called attention to the relation of focal infections to thyrotoxicosis and reports cases that have been cured by tonsillectomy and removal of foci of infection in the jaw.

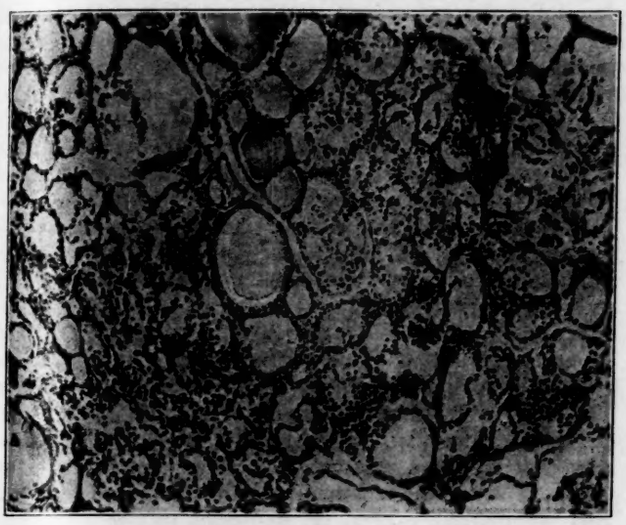

Fig. 4.—The desquamation and hyperplasia shown in this section were produced by injections of toxic doses of histamine. The animal received a total of 133 mg. of histamine per kilogram of body weight, divided into four daily doses. The dog was very ill and was killed the day following the last injection. The basal metabolism of this animal rose to 60 per cent above normal without any rise in temperature. The same histologic changes as noted here can be produced by toxic doses of glycocoll extended over a few days.

Many authorities agree now that exophthalmic goiter is not a true hyperthyroidism but a dysthyroidism. The fact that Weir [14] did not observe any relation of the thyroxin content of glands removed from patients with toxic goiter to the basal metabolic rate supports this assumption. It is no doubt true, however, that a third and unknown factor besides lack of iodine and excessive strain on the thyroid, of a toxic, physiologic or infectious nature, exerts an important rôle in the production of the disease. There is a strong indication of a relation of the suprarenals and autonomic nervous system to the etiology of exophthalmic goiter. Marine [15] has noted that there is a definite increase in metabolic rate beginning from three to six weeks after suprarenalectomy and lasting from a few weeks to several months, provided the thyroid gland is intact.

In some recent experiments, we have observed that the oral administration of iodine to animals suffering from severe infections and toxemias will to a large extent protect the thyroid from the severe desquamation and hyperplasia that might otherwise be expected. The amount of iodine per kilogram of body weight in the glands is likewise maintained; in fact, it will average between 75 and 100 per cent above the normal amount. If iodine is given to animals in the absence of infections, the thyroids may absorb three or four times the amount of iodine normally found in the gland. The same protection is afforded by thyroid extract, except that the iodine content may not be quite as high as that found in the animals fed iodine. Our routine procedure in iodine feeding is to give 1 minim (0.06 cc.) of compound solution of iodine per kilogram of body weight daily for from four to six days before producing the infection, and the same amount daily for each succeeding day the dog lives.

As a means of producing infections in the animals, we resorted to the injection of intestinal content which we removed from the loops of the small intestine of dogs dying from obstruction produced experimentally in the region of the ileocecal valve. This fluid contained not only "intestinal loop toxin," but also, on culture, vigorous strains of hemolytic streptococcus, *B. welchi*, *B. coli* and *B. proteus*. Our hope of obtaining a medium that would constantly produce severe pathologic changes in the thyroid was realized, since a subcutaneous injection of 0.8 cc. of the fluid per kilogram, with repetition of the dose in four days, practically never failed to produce the desired changes in dogs not receiving iodine. The animals became very sick within a few hours after the injection and remained so for four or five days after each injection, until an abscess which had formed ruptured spontaneously or was opened surgically. Some of the animals died from the effects of the toxin and infection.

When iodine was fed to dogs in the absence of infection, we found that the gland reverted to the "resting colloid state" in from eight to ten days. The average time required for this conversion from hyperplasia to a pure colloid gland was found to be twenty-six days by Marine and Lenhart. Variation in the amount of hyperplasia may account for the difference in time. An interesting and seemingly conflicting observation has been made by Gray and Loeb [16] in which they note an increase in mitosis in the thyroid of guinea-pigs during the first three or four weeks following daily oral administration of 0.05 Gm. of potassium iodide.

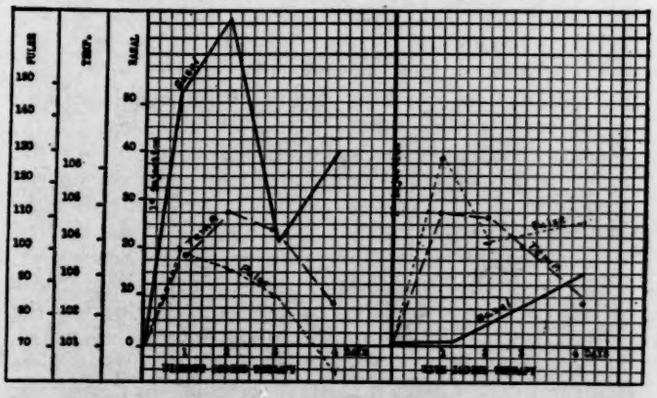

Fig. 5.—Comparison of the basal metabolic rate of two animals that were injected with an equal amount of "loop toxin" per kilogram of body weight, as described in the text. Note that the metabolic rate of the animal not receiving iodine rose to 60 per cent above his normal level, whereas the rate of the animal receiving iodine did not at any time rise above 15 per cent. The contrast is usually not so striking but is practically always present. The basal metabolic rate of the animals receiving iodine in the presence of infections produced in this manner tends to follow the temperature curve in its elevation, whereas the metabolic rate of the animals not receiving iodine will rise far above the level corresponding to the temperature (when the accepted factor of 7.2 per cent rise in basal metabolism is used for every degree rise in temperature, Fahrenheit scale).

In some experiments reported elsewhere, we [17] have shown that the basal metabolic rate of dogs rises sharply

13. Billings, Frank: Focal Infection: Its Broader Application in the Etiology of General Diseases, J. A. M. A. **63**: 899 (Sept. 12) 1914.
14. Weir, J. F.: The Thyroxin and Tryptophan Content of the Diseased Thyroid Gland, and the Iodine Compounds in Desiccated Thyroid, Am. J. M. Sc. **169**: 860 (June) 1925.
15. Marine, David: The Thyroid Gland and Its Relation to Disease, Bull. New York Acad. Med. **3**: 575 (Sept.-Oct.) 1927.
16. Gray, S. H.; and Loeb, Leo: The Effect of Oral Administration of Potassium Iodide and Thyroid Substance on the Mitotic Proliferation and Structure of Acini in the Thyroid Gland of Guinea-Pigs, Am. J. Path., to be published.
17. Womack, N. A.; Heideman, A. G., and Cole, W. H.: The Thyroid Gland in Infections: The Effect on the Basal Metabolic Rate, read before the annual meeting of the Association for the Study of Internal Secretions, Minneapolis, June 12, 1928.

during infections as produced in the manner previously described in this article. There was a rather constant correlation between fever and the basal metabolic rate, as has been noted by Barr and Du Bois [18] and others, but a more constant correlation was found to exist between the basal metabolic rate and the severity of the infection, as determined by the physical condition of the animal and the extent of the local inflammatory process. Usually, the basal metabolic rate would rise to heights entirely out of proportion to the rise in tem-

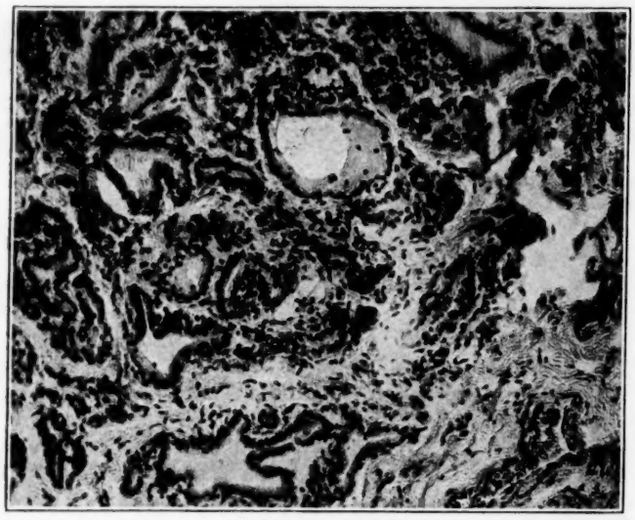

Fig. 6.—Hyperplasia, loss of colloid and mild desquamation as found in the thyroid gland of a patient who died from a colon bacillus peritonitis of three weeks' duration. The gland weighed 54 Gm. (about twice normal weight) and contained a total amount of only 2.4 mg. of iodine as compared to the normal of 22.4 mg. per gland.

perature on the first and second day following injection of the toxin and bacteria. Frequently, a basal metabolic rate of from 30 to 40 per cent above normal for that particular dog would be found in the presence of a normal temperature.

These observations suggest strongly that there is a more important factor controlling basal metabolic rate in these experiments than that associated with fever. Possibly the demands made by other organs in the body on the thyroid for its catalytic secretion during these periods of excessive strain is sufficient to alter the basal metabolism. The exact relation of the thyroid to this change in metabolic rate cannot be determined exactly, but the fact remains that hyperplasia and loss of colloid are constantly seen in the thyroid during the periods when these changes in metabolic rate are noted. The observations of Birk,[19] who found that there were changes in the nitrogen and salt metabolism during the incubation period of such infectious diseases as measles and chickenpox, before the onset of fever, supports this view. Grabfield and his associates [20] have made a very important contribution to the relation of nitrogen excretion to the thyroid. They observed that there was a daily increase of 27 per cent in the amount of nitrogen excreted by dogs after the subcutaneous injection of a solution of sodium iodide, which did not occur when the thyroids were removed.

The rôle of the thyroid in the maintenance of body immunity against bacterial toxins and other poisons has been discussed pro and con for years. Wells, McCarrison and others favor the idea that the thyroid takes an active part in the resistance of the body to many toxins. In fact, McCarrison, speaking of the thyroid, remarks that "it exercises a protective antitoxic and immunizing action, defending the body not only against the toxic products of its own metabolism, but against invasion by disease—producing microorganisms and injury by their products." Pickworth [21] feels that the extreme variations which he obtained in the iodine content of thyroids of patients who succumbed to acute infections indicates a very marked relation between thyroid activity and septic processes. The selective action of certain toxins and infectious processes against the thyroid (histologically and chemically) which we have observed leads us to concur strongly in these opinions.

As stated previously, the oral administration of compound solution of iodine (Lugol's solution), to the animals in which severe infections were produced tended to create a protection against the hyperplasia, desquamation and loss of colloid which so constantly accompanies severe infections. The interpretation of this observation is difficult. Offhand, one might be led to believe that a greater immunity had been conferred on the thyroid, if not also on the entire animal body. The fact that the dogs receiving iodine were not as sick as the dogs which did not receive iodine strongly supports this possibility. Moreover, two dogs in this series not receiving iodine succumbed to their infection, whereas none of the animals that received iodine died. Needless to say, to each animal with an infection was assigned a control animal which received the same amount of "loop toxin with bacteria" per kilogram of body weight. Each received the same food and treatment except that one animal was given iodine, whereas the other was not.

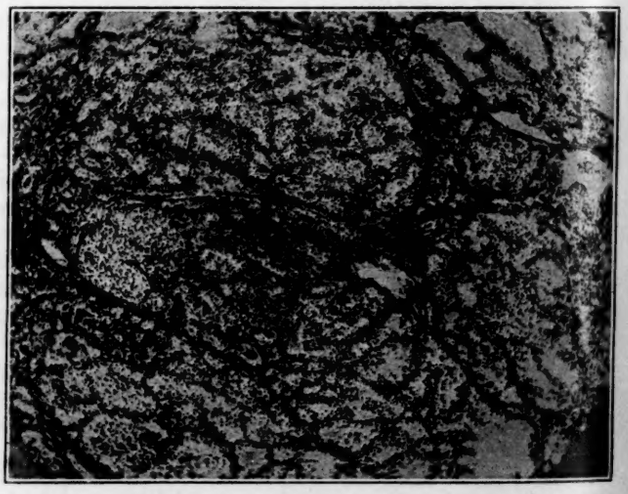

Fig. 7.—Section taken from a thyroid gland removed from a patient with exophthalmic goiter. The routine preoperative iodine therapy was administered but, as shown, no involution has taken place. Analysis revealed a total iodine content of only 3.4 mg., as compared to an average of 48.0 mg. in the excised glands which were removed from patients with exophthalmic goiter after iodine therapy. This patient returned nine months later with a recurrence of his goiter. Other data which have accumulated lead us to believe that the nonabsorption of iodine by glands of the exophthalmic type, which also show a failure to involute, is a bad prognostic sign from the standpoint of recurrence.

In spite of the protection of the thyroid gland and the presumably increased immunity conferred on the animals receiving iodine, we still feel reluctant in sug-

18. Barr, D. P., and Du Bois, E. F.: The Metabolism in Malarial Fever, Arch. Int. Med. **21**: 627 (May) 1918.

19. Birk, W.: Metabolism in Fever, München med. Wchnschr. **71**: 1745 (Dec. 12) 1924.

20. Grabfield, G. P.; Gray, C.; Flower, B., and Knapp, E.: The Mechanism of the Action of Iodides on the Nitrogen Metabolism, J. Clin. Investigation **4**: 323 (Aug.) 1927.

21. Pickworth, F. A.: The Iodine Content of the Thyroid Gland, J. Ment. Sc. **71**: 703 (Oct.) 1925.

gesting that iodine has therapeutic indications in infections. For years, iodides have been given empirically to patients with infections, but no proof of benefit has been offered. Recently, Baillie and Aberd [22] of England, and Jeudwine [23] and others in India have reported striking therapeutic results from the intravenous use of iodine in infections.

Iodine Content of Human Thyroid Glands as Removed at Autopsy and at Operation *

Number of Cases	Diagnosis	Gland Excised, Gm.	Gland Total, Gm.	Mg. of Iodine per Kg. of Body Weight	Mg. of Iodine per Gm. Fresh Gland	Total Iodine, Mg.
3	Peritonitis (fulminating type)	.....	19.1	0.196	0.509	11.066
4	Bronchopneumonia	.....	28.5	0.279	0.817	20.109
3	Carcinoma (with terminal pneumonia)	.....	25.6	0.293	0.591	12.536
3	Carcinoma (without terminal infection)	.....	31.8	0.553	1.368	30.501
2	Lung abscess, chronic (had iodized oil injections)	.....	32.0	2.063	2.635	92.85
12	Exophthalmic goiter (gland involuted)	53.8	62.7	0.832	0.765	48.0
1	Exophthalmic (gland not involuted)					
	First operation	50	58	0.085	0.068	3.4
	Second operation	10	10.5	0.019	0.097	0.968
1	Exophthalmic (gland not involuted)	40	47.0	0.194	0.292	11.68
	Exophthalmic goiter (without iodine therapy)†	45	....	.....	0.400	18.0
5	Toxic adenoma (iodine therapy)	104	121	1.234	0.520	62.9
1	Nontoxic adenoma (without iodine therapy)	320	388	0.338	0.099	38.28
6	Normal gland (vicinity of St. Louis)	.....	24	0.373	0.933	22.4

* The figures in the right hand columns represent the average of the number of cases as indicated in the left hand column. A total of forty-one thyroids that were removed at autopsy were examined. The results in the individual cases are tabulated in a publication elsewhere.

† Figures in this group are taken from the literature.

SUMMARY

Further work on the relation of infections and toxemias to the histologic picture of the thyroid gland confirms our observations concerning the production of hyperplasia, loss of colloid, desquamation and decrease in iodine content in certain septic processes and toxemias. Somewhat similar observations have been recorded by other workers. We have developed a toxin containing a group of four organisms which, when injected subcutaneously into dogs, will produce these changes in practically 100 per cent of the animals if iodine has not been ingested by them. The average iodine content of the thyroid of normal dogs is 0.304 mg. per kilogram of body weight, whereas the average iodine content of the thyroid glands of animals dying from severe infections is 0.142 mg. per kilogram of body weight. Similar changes have been observed in the thyroid glands of human beings who have succumbed to acute infections, but these changes are present to a lesser degree. Evidence points to a relation of infections to hyperplastic glands in human beings. Basal metabolic studies made by us [17] on animals with hyperplastic glands produced by toxemias and infections have revealed a basal metabolic rate elevated out of proportion to the fever. Injection of toxic doses of histamine produces a marked rise in the metabolic rate, without a significant rise in temperature, and also creates a desquamation, loss of colloid, decrease in iodine content and beginning hyperplasia in the thyroid gland. Injection of toxic doses of an amino-acid (glycocoll) produces the same histologic changes. The pathologic changes already mentioned in the thyroid as produced by infections can be prevented to a great extent by the oral administration of iodine. The data assembled support the theory that the thyroid gland takes an active part in the resistance of the body against certain toxins and infections. In spite of the added information that iodine exerts a protective rôle in the attack on the thyroid by infections, we still feel reluctant to advise the therapeutic administration of iodine to human beings suffering from severe infections.

602 South Euclid Avenue.

22. Baillie, D. M., and Aberd, M. D.: The Use of Intravenous Iodine in Influenzal Bronchopneumonia, Lancet **1**: 423 (March 15) 1919.

23. Jeudwine, W. W.: Therapeutic Value of Intravenous Iodine: Based on Three Years' Experience in Four Hundred Cases, Indian M. Gaz. **58**: 561 (Dec.) 1923.

ADENOMA AND CANCER OF THE THYROID

A STUDY OF THEIR RELATION IN NINETY EPITHELIAL NEOPLASMS OF THE THYROID *

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It is evident from observations of diseases of the thyroid gland that cancer of this organ is neither as rare nor as hopeless as was formerly supposed. Until recently studies on this subject have been hampered by scarcity of material and by a confusing and cumbersome pathologic classification. A significant and important observation made and emphasized by many writers is that carcinoma of the thyroid frequently originates from goiter. In order to present additional data concerning this point, a study has been made of material available in the departments of pathology and surgery. All far advanced carcinomas of the thyroid considered hopeless and not operated on were excluded from consideration. The thyroids removed at operation during a fifteen year

Fig. 1.—Fetal adenoma: majority of acini undifferentiated with a few colloids containing acini. Other portions of gland showed medullary carcinoma.

period from 1912 to 1927 were examined and of the total number ninety were found to be epithelial malignant neoplasms. In one instance carcinoma was found arising from the hyperplastic gland of exophthalmic goiter. This agrees with the general view as expressed

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* Read before the Section on Surgery, General and Abdominal, at the Seventy-Ninth Annual Session of the American Medical Association, Minneapolis, June 13, 1928.

by Wilson,[1] Kocher,[2] Simpson[3] and others that this association is extremely rare. Pemberton[4] reports one such case in 276 cases of malignant disease of the thyroid. Exclusive of the cases of exophthalmic goiter, the incidence of carcinoma in this group is 4 per cent. There is some variation in the incidence of carcinoma reported by various observers: 1.2 per cent by Graham;[5] 2.7 per cent by Pemberton;[4] 4.6 per cent by Speese and Brown,[6] and 10 per cent by Kocher.[2] It is interesting that the greatest incidence comes from Switzerland, where goiter is extremely common. The relatively high incidence in this series substantiates the opinion expressed by Kocher and later by Bauman[7] of the greater relative frequency of malignancy of the thyroid in goitrous areas.

The patients in this clinic come almost entirely from the Great Lakes basin, where the incidence of goiter is very high. Routine autopsy examination here shows that 80 per cent of the subjects have an adenomatous goiter. Only 15 per cent of the goiters are of the exophthalmic type. Studies of the goiter common to

Fig. 2.—Adenoma simplex colloids: possible hyperthyroidism.

this region show that clinically it consists largely of colloid elements at its inception before or during puberty but that adenomas appear early and are obvious in the decade following puberty. After growth is attained, they are almost universally present and dominate the goiter picture. There exist minor differences of opinion on various phases of the classification and mode of origin of adenomas, but the main facts are commonly accepted. Our clinical observations substantiate the opinion of Dr. Warthin[8] that the adenoma is a congenital disturbance of development comparable to the adenofibroma of the mammary gland, the adenoma of the kidney cortex or the myofibroma of the uterus. Adenomas are present at birth and may or may not undergo further development in adult life and react to functional and environmental stimuli. They may be single or multiple, more frequently the latter. In goiter regions they show an especial tendency to develop and in this development show a fairly uniform trend in histologic change. They may be classed as: (1) fetal or embryonal types; (2) simple or colloid type, and (3) papilliferous type. The fetal type is the most common form, particularly in younger persons; the simple colloid adenoma is most probably an adult cyclic form of the fetal type. It is also possible that the papilliferous form may be developed from the fetal type, but many of them are papilliferous from birth. No true adenomas originate in extra-uterine life. The so-called nodular or diffuse adenomatous colloid goiter is made up of lobules of thyroid tissue assuming a nodular form as the result of the development of an excess of stroma in the interlobular septums. The true adenoma is always well encapsulated; it has a poor blood supply and with age undergoes a definite retrogressive cycle: atrophy and disappearance of acini, increase of stroma with hyaline change, calcification, and colloid cyst formation. Hemorrhagic or anemic infarction is common; in the former, hemorrhage, blood pigment and cholesterol appear in the histologic picture.

A more practical classification of the adenoma would be into two classes: adenoma without associated predisposition to hyperthyroidism, and adenomas with associated predisposition to hyperthyroidism.

The latter will show hyperplastic lymph nodes, either in the adenoma or in the thyroid tissue proper, or in both. Aschoff[9] says: "The adenomas passing through their phases of development and involution without exception represent true neoplasms whose significance for the organism is quite different from that of normal thyroid gland tissue or that of a hyperplastic thyroid gland tissue." Aside from abnormalities of function induced by them, the great importance of the adenoma is that carcinoma usually, if not always, has its origin in an adenoma. The exact frequency of this pathologic change cannot be given, but approximate estimates are possible.

It has been a common observation by many writers that cancer of the thyroid is frequently preceded by a goiter. In this series a history of a goiter of three years' duration or longer was present in 76 per cent. The average duration of the goiter was 14.8 years; the majority of the goiters were first noted in the third decade. The history of a goiter is not reliable, for many patients are unaware of the presence of a fairly large gland that occupies a deep cervical or substernal position. Fully 20 per cent of patients with hyperthyroidism are ignorant of the existence of a goiter until it is pointed out to them. In our series 12 per cent of the patients were unaware of the presence of a tumor that could be demonstrated and which proved to be some form of carcinoma. Undoubtedly many adenomas are present for years without the patient's knowledge and all estimates based on preexisting goiter in patients with cancer would prove to be much higher if the true facts were known. It is also true that malignant tumors may develop so slowly that they may be erroneously supposed to have been benign goiters at their inception. A more accurate proof of the existence of this relationship is found in the examination of tissue removed at operation or autopsy. In this series, gross and microscopic examination of the thyroid tissue showed positive evidence

1. Wilson, L. B.: Malignant Tumors of the Thyroid, Ann. Surg. **74**: 129-184 (Aug.) 1921.
2. Kocher, T.: Zur klinischen Beurteilung der bösartigen Geschwülste der Schilddruse, Deutsche Ztschr. f. Chir. **91**: 197-307, 1908.
3. Simpson, W. M.: Clinical and Pathological Study of Fifty-Five Malignant Neoplasms of the Thyroid Gland, Ann. Clin. Med. **4**: 643-667 (Feb.) 1926.
4. Pemberton, J. de J.: Malignant Disease of the Thyroid Gland, Am. Surg. **87**: 369-377 (March) 1928.
5. Graham, Allen: Malignant Epithelial Tumors of the Thyroid, Surg. Gynec. Obst. **39**: 781-790 (Dec.) 1924.
6. Speese, J., and Brown, H. P., Jr.: Malignant Degeneration of Benign Tumors of the Thyroid Gland, Ann. Surg. **74**: 684-690 (Dec.) 1921.
7. Bauman, H. A.: The Early Diagnosis of the Malignant Thyroid, Especially Carcinoma, Minnesota Med. **3**: 105-112, 1920.
8. Warthin, A. S.: Personal communication to the author.
9. Aschoff, Ludwig: Lectures on Pathology, New York, Paul B. Hoeber, 1924.

of tissue changes characteristic of some phase of endemic goiter in the noncancerous portion of the gland in all except one. Thus, 98.8 per cent of this group showed evidences of preexisting goiter. Pemberton [4] finds evidence of this relationship in 87 per cent, Graham [5] in 90 per cent, and Brown and Speese [6] in 78 per cent. The higher incidence in our group is undoubtedly due to factors already discussed, the severity of the goiter belt in which the patients live and the nearly universal abnormalities of their thyroid glands.

Fig. 3.—Adenoma papilliferum without malignancy in a patient 60 years old; other areas of gland showed medullary adenocarcinoma.

Of the ninety cases under consideration, 72.2 per cent occurred in women and 27.8 per cent occurred in men, this being relatively the same sex ratio that exists in the total number of endemic goiters in the entire group. The ages of the patients do not differ widely from those with cancer elsewhere, in that the majority, 56 per cent, occurred between the ages of 40 and 60. It is worth noting that 34 per cent occurred between the ages of 14 and 40, showing that one cannot discount the diagnosis of carcinoma of the thyroid in relatively young people. The youngest was a boy of 14 years and the oldest was a man of 72. It might be expected that in a severe goiter district the carcinomatous change might appear at an earlier age, since here the adenomas appear at a much earlier age, even at birth. These adenomas will undergo retrogressive changes earlier in life than when they begin to develop at a later period.

The classic symptoms of carcinoma of the thyroid are those of a relatively late stage of the disease, among which are a rapidly growing tumor, nodular hardness of the growth and fixity from infiltration of the surrounding structures. An analysis of the leading complaint of the patients showed that only 15 per cent noted rapid enlargement of the thyroid while 27 per cent complained of pressure symptoms, such as dyspnea, voice changes and pain radiating to the neck or thorax, without gross change in the thyroid or goiter. The commonest chief complaints were those symptoms usually associated with hyperthyroidism, such as nervousness, loss of weight, tachycardia and palpitation, which were present in 47 per cent. Eleven per cent did not complain of anything except a goiter of long standing which they wished removed for cosmetic or prophylactic reasons. It is not known whether the basal metabolic rates were abnormal in all of these patients with symptoms suggestive of hyperthyroidism, since this determination was not made on all of them.

In the last forty cases observed, the basal metabolic rates have been carefully checked and of these 44 per cent had high rates ranging from plus 16 to plus 80; 10 per cent had rates slightly below normal varying from minus 7 to minus 15 and the remainder, or 46 per cent, had rates within normal limits. The fact that most patients had rates that were normal or above suggests that malignant thyroid tissue may retain some of its original function. The evidence against this is the fact that Marine and Johnson [10] showed that malignant thyroid tissue, both in the original tumor and in metastatic nodules, is unable to retain iodine. This work has been substantiated more recently by Eisen.[11]

In this connection it is of interest to note that three of our patients gave histories of having been treated for quiescent adenomatous goiters by large doses of iodine given as the compound solution of iodine with the idea of reducing the goiter. After the iodine had been taken for some weeks, the goiters began to increase rapidly in size with the appearance of definite symptoms of hyperthyroidism. The increase in the size of the goiter continued until it was removed and examination of these glands showed all gradations of all change, from active proliferation of the adenomas similar to the usual appearance associated with hyperthyroidism to definite adenocarcinoma. It is known that iodine in excess produces peculiar reactions in the true adenoma; it also may excite proliferation of the epithelial tissue, and in some cases a lymphoid infiltration of the adenoma may give a histologic picture resembling that of Riedel's struma. The occurrence of cancer in these three cases may be entirely coincidental, especially as a large number of patients with adenomatous goiter unfortunately receive this type of treatment; but the observation seems of interest. The fact that most of the malignant tumors are associated with benign adenomas that do have a capacity to function or hyperfunction makes it appear more than likely that the associated nonmalignant portions of the goiter cause the hyperfunction when it is

Fig. 4.—Adenocarcinoma arising in fetal adenoma.

10. Marine, David; and Johnson, A. A.: Experimental Observations on the Effects of the Administration of Iodine in Three Cases of Thyroid Carcinoma, Arch. Int. Med. **11**: 288-299 (March) 1913.

11. Eisen, D.: Malignant Tumors of the Thyroid: Analysis of Seven Cases with Study of Structure and Function of Metastases, Am. J. M. Sc. **170**: 61-74 (July) 1925.

present. On the other hand, it does not seem entirely proved that the malignant tissue may not in some instances have the power to function. It does seem clear, however, that there is neither a constant nor a characteristic basal metabolic rate associated with malignant disease of the thyroid that might aid in the diagnosis.

An outstanding fact concerning the diagnosis is the difficulty with which it is made early and the ease with

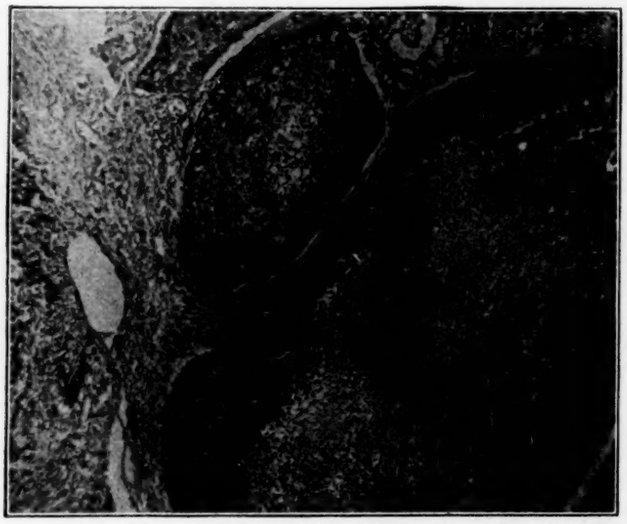

Fig. 5.—Carcinoma medullare: large cancer rests showing central necrosis.

which it is made late. A positive diagnosis of carcinoma was made in 25 per cent of the cases, a presumptive diagnosis was made in 28 per cent, and carcinoma was not suspected in 47 per cent. The striking feature is the number of unsuspected carcinomas that existed in this group. The number of correct diagnoses would be much higher if one considered the far advanced inoperable cases in the group, but the number of possible cures would not be increased by this apparent improvement in diagnosis. As Balfour [12] has pointed out, the percentage of correct diagnoses of cancer can be raised at the expense of making incorrect diagnoses of adenomas with recent hemorrhage, connective tissue degeneration and calcification. It is difficult or impossible to make the diagnosis until the carcinoma has broken through the capsule of the adenoma from which it originated. If the adenoma is superficially placed, cancer may be suspected by its hardness and surface irregularity, but if the adenoma is deeply placed the presence of malignancy may not be suspected until symptoms arise from invasion of deep structures. In nearly half of our cases the diagnosis was made only after microscopic examination, and the diagnosis could not have been made before operation. It could have been suspected only by recognizing the frequency of the association of carcinoma with adenoma. Cure can usually be hoped for only when the clinical diagnosis is difficult or impossible.

The classification of carcinoma of the thyroid presents certain difficulties, as many elaborate systems of classification have been advanced. It is common to find several different types in a single specimen with all possible gradations. To the pathologist unfamiliar with the wide variety of morphologic appearances of various phases of goiter, there may be a tendency to make a diagnosis of carcinoma on insufficient evidence and some surgeons have felt that the diagnosis of cancer should not be made without the clinical evidence. The reports of Dunhill,[13] Pemberton [4] and Simpson [3] show that the pathologic diagnosis alone is accurate and that clinical evidence of metastasis and recurrence may occur later. In the thyroid more than in other organs there is some difference of opinion as to what is cancer. We have followed the criteria of Warthin,[8] which are as follows:

The usual criteria of malignancy: changes in cell type and staining reaction, alteration in function as shown by the disappearance of colloid, abnormal architecture, infiltration of surrounding tissue, inflammatory reactions about the neoplasm, extension into lymphatic and blood vessels, abnormal retrogressive changes in the parenchymatous cells of the new growth, and finally metastases—all of these apply to the diagnosis of thyroid carcinoma as in malignancy in other organs. To any one familiar with the cyclic histologic changes in the thyroid, particularly those associated with exophthalmic goiter, the differential diagnosis of malignancy using the ordinary criteria presents no especial difficulty in the case of the great majority of thyroid cancers. It must be remembered, however, that an inexperienced pathologist may mistakenly diagnose the typical parenchymatous hypertrophy of exophthalmic goiter as adenocarcinoma or papilliferous adenocarcinoma. Such mistakes are by no means rare. Only in the case of malignant adenoma colloids in which the structure of the neoplasm may closely imitate that of normal gland structure is there likely to be any difficulty in the diagnosis. When metastases of such malignant adenomas are found in the bones or in other tissues, the fact that they are out of place is sufficient for the diagnosis. A study of numerous blocks from the primary lesion in the thyroid will always reveal local evidence of malignancy, particularly the invasion of normal thyroid tissue by the atypical acini and their extension into the lymphatics and veins in the trabeculae of the gland. Graham's [5] criterion of growth into blood vessels would apply in this case but in the great majority of cases of thyroid cancer such a criterion of malignancy is not necessary to the correct diagnosis, and in many cases extension into the blood vessels will not be found. It must be emphasized

Fig. 6.—From same thyroid as figure 5: Small undifferentiated cell carcinoma infiltrating stroma of adenoma; tendency to scirrhous type.

here in this connection that hematogenous metastasis is not common in cases of thyroid carcinoma until cervical and mediastinal nodes have reached a large size. The early hematogenous metastases into bones and lungs are relatively rare.

The tumors in this series were grouped according to the predominant architecture and manner of growth into four types: (1) carcinoma solidum; (2) carcinoma

12. Balfour, D. C.: Cancer of the Thyroid Gland. M. Rec. **94**: 846-850 (Nov. 16) 1918.

13. Dunhill: Proc. Roy. Soc. Med. London (Surg. Section) **18**: 38-40, 1925.

medullare; (3) carcinoma adenomatosum, and (4) carcinoma scirrhosum. In commenting on these groups no attempt is made to give details of treatment or end-results, which do not fall in the scope of this paper.

Types 1 and 2 are usually diffuse, carcinoma solidum consisting of cell nests and stroma about equal in amount, while carcinoma medullare is marked by large cell nests with a relatively small amount of stroma. The glandlike structure is not evident in either and in both

Fig. 7.—Carcinoma solidum: Occurred in goiter of a man, aged 28. He had an infiltrated capsule of adenoma from which it arose.

the cells are undifferentiated. There were twenty-five cases, or 28 per cent, of these types. Metastases occur early, often of the blood-borne type to lungs and bone, because of early invasion of blood vessels. Growth is rapid and diagnosis too often obvious. In a few cases, these types were confined to single adenoma. The prognosis is always grave and the majority of patients do not survive the three year period.

In type 3, carcinoma adenomatosum or adenocarcinoma, the acinous structure is still evident and a number of variations are distinguishable. There were sixty cases, or 66 per cent, of this general type. In most of these cases the neoplasm clearly originated in an adenoma which might be of any type. About a third were of the diffuse infiltrative type, while the remainder were confined to single adenomas. In the diffuse variety metastases are common, appearing somewhat later than with carcinoma medullare or solidum. Blood vessels were frequently invaded with formation of tumor thrombi. At times the regional lymph nodes were massively involved. The name malignant adenoma is reserved for those cases in which a solitary adenoma was involved. The variants of adenocarcinoma present were papilliferous adenocarcinoma, colloid adenocarcinoma, medullary adenocarcinoma and papilliferous cyst adenocarcinoma. It is these adenomas with contained neoplasm which cannot be diagnosed clinically as carcinoma that are of greatest interest, since a cure can often be effected by their removal. Some clinicians are prone to feel that these do not represent true carcinoma since one cannot demonstrate massive infiltration or metastases; yet of this group who have passed the three year period, 40 per cent are dead of recurrence and metastasis. Metastases or recurrence may occur after a number of years and prognosis must be guarded. The prognosis is undoubtedly much better than in the diffuse forms but it seems clear that we must regard the malignant adenoma as an early form of true thyroid cancer, in its only favorable state for cure.

Type 4, carcinoma scirrhosum, occurred only five times, or in 5.5 per cent. It is characterized by excess of stroma over the epithelial cells and undifferentiated cells. The diagnosis was suspected in one case and not made in the others. The growth is slow. All the patients are alive with recurrence in one, but all are still in the three year period. Other forms, such as squamous cell carcinoma and carcinoma mucosum, were not encountered in this study and it is probable that they are not primary in the thyroid but arise in teratoid structures such as branchial arch or thyroglossal duct structures. The malignant mixed forms of "sarco-carcinoma" may be malignant teratomas, but in some cases they are carcinomas in part scirrhous and in part acinous or medullary.

As a result of this and other studies, it seems fairly certain that most carcinomas of the thyroid have their origin in adenomas. The ratio of carcinoma to goiters removed varies with the clinic from 1.2 per cent to 4.6 per cent, but this gives an exaggerated idea of the dangers of the adenoma as a precancerous lesion. As Balfour [12] pointed out, patients with cancer of the thyroid eventually seek surgical aid, while the majority of persons with adenomatous goiters are not operated on. The true incidence of carcinoma in adenoma cannot be stated, but it would be very much less than any figures we have at present. The adenoma is a precancerous lesion but the true incidence is so small that it should not be a great cause for anxiety to the person with an adenomatous goiter, as the adenoma usually exists for years before undergoing carcinomatous degeneration. However, it must be recognized that the chance of cure lies mainly in the eradication of the adenoma before cancer becomes obvious. When one considers the other dangers of adenomatous goiter, such as hyperthyroidism

Fig. 8.—Carcinoma scirrhosum occurring in a hyperplastic gland. The patient had the signs and symptoms of exophthalmic goiter.

and cardiac injury, together with its precancerous potentialities, its early removal may be regarded as a sound piece of prophylactic surgery.

SUMMARY

1. In a study of goiters from a severe goiter area removed surgically, ninety malignant epithelial neoplasms of the thyroid were found, comprising 4 per cent of all endemic goiters.

2. A history of preexisting goiter was present in 75 per cent, but microscopic examination showed evidence of its origin from some type of endemic goiter in all except one instance. This exception arose from the hyperplastic gland of exophthalmic goiter.

3. Of the patients, 72.2 per cent were female and 27.8 per cent were male, the same ratio that exists in the total number with endemic goiters.

4. The ages varied between 14 and 72, with 34 per cent occurring before 40 and 56 per cent between the ages of 40 and 60.

5. The chief leading symptoms were those associated with hyperthyroidism; next in frequency were pressure symptoms, while rapid growth was noted in only 15 per cent.

6. Of those examined, 46 per cent had an abnormally high basal metabolic rate.

7. Correct preoperative diagnosis was made in only 25 per cent, while in 47 per cent the diagnosis was unsuspected.

8. Histologically, 28 per cent of the growths were medullary carcinoma, 66 per cent adenocarcinoma and 5.5 per cent scirrhous carcinoma. A large number of adenocarcinomas were confined to adenomas. These should be considered true early carcinomas of the thyroid.

9. Adenoma of the thyroid is a precancerous lesion with a small but definite incidence.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. COLE AND WOMACK AND DR. COLLER

DR. WALTER M. SIMPSON, Dayton, Ohio: In a clinical and pathologic study of the thyroid glands of 1,449 patients made at the University of Michigan, we found fifty-five cases of malignant disease, including fifty carcinomas and five sarcomas. One hundred and fifty-nine of these cases were diagnosed as exophthalmic goiter, and in no case did we find carcinomatous transformation in true exophthalmic goiter. Exclusive of this disease, there was an incidence of 4.03 per cent of malignancy. One extraordinary thing about this study was that 60 per cent of the cases of carcinoma were unrecognized clinically. The diagnosis was made only as a result of microscopic study. This emphasizes the importance of examining many sections. Twenty-eight of the fifty-five cases were associated with hyperthyroidism, and in five cases exophthalmos was present. We found definite evidence of preexisting goiter in every case, and in the great majority it was the adenomatous colloid goiter. It must be borne in mind that all of our cases originated in the Great Lakes goiter region. It has been emphasized by many writers that thyroid carcinoma most frequently originates in a fetal adenoma. We found only five cases in which carcinoma had its origin in a fetal adenoma. The bizarre classifications of thyroid neoplasms have led to much disagreement between clinician and pathologist. The simple classification proposed by Dr. Coller is certainly to be recommended, because there is no reason why carcinomas arising in the thyroid gland should not lend themselves to the same simple classification that characterizes malignant tumors originating elsewhere. We experienced no difficulty in grouping all of our cases of carcinoma into medullary carcinomas, adenocarcinomas, and scirrhous carcinomas. The frequency with which carcinoma arises in an adenoma and the fact that 60 per cent of the diagnoses were made only as the result of microscopic study, together with the fact that more than half of our cases were associated with signs of hyperthyroidism, provide a multiplicity of reasons for considering every patient with adenomatous colloid goiter as a subject for operation. I cannot agree that the diagnosis of carcinoma of the thyroid gland may be made on the basis of vascular invasion alone. In two of our cases of malignant adenoma, serial sections did not show any evidence of vascular invasion. Nevertheless, these patients died of recurrence and metastasis. Who can tell when the first nests of carcinoma cells break off and enter a vessel and are carried to the lungs or to the long bones? Therefore, I think it is wrong to place the entire emphasis on vascular invasion.

DR. DAVID C. STRAUS, Chicago: In our experience at the Michael Reese Hospital, I have been impressed with the fact that after epidemics of influenza or upper respiratory infections there is a very definite, noticeable increase in the number of cases of toxic goiter. I wonder whether toxic goiters are associated with chronic infections elsewhere in the body, such as infections of the gallbladder or the appendix? I have been impressed with the frequent association of gallbladder disease and toxic goiter and believe that the infection in the gallbladder may be of etiologic importance. While it is generally recognized, and I think it should be very definitely stressed, that no operation of election, such as the removal of a chronically diseased gallbladder or appendix, should be carried out before thyroidectomy is done, it is equally important that after thyroidectomy is done this focus of infection should be removed. The experimental evidence submitted by Drs. Cole and Womack gives the reasons for these facts and explains why they occur. I wonder whether the authors have considered the advisability of administering iodine in these epidemics of upper respiratory infections as a means of prophylaxis of toxic goiters following in their wake. The most interesting part of their paper was the demonstration that in experimental animals, when iodine and the same dose of toxin were given, there were no changes in the thyroid, whereas in the animals receiving the toxin only, the changes were very definite and very marked.

DR. J. EARL ELSE, Portland, Ore.: The causes of goiter may be considered as primary and secondary, the primary causes including first, and chiefly, iodine deficiency, and secondly, anything that interferes with the efficiency of the thyroid gland. It has been our observation that following epidemics, as of influenza, there is always a marked increase in the number of patients with toxic goiter, particularly the exophthalmic type. Following the 1918 epidemic of influenza, I saw more cases of toxic goiter than I did cases of empyema. Drs. Cole and Womack have shown very clearly how this occurs. The toxin from the infection produces a deficiency in the activity of the thyroid gland. At the same time, the infection produces a demand for more secretion from the thyroid, because anything that increases activity causes a greater demand for thyroid secretion. Consequently there is a primary interference with the efficiency of the gland and a secondary demand for more thyroxin, which explains clearly why there is an increase in the number of patients with hyperthyroidism following infections of that type. We see entirely too many patients going about with adenomatous goiters of ten, twenty, thirty and forty years' standing. Nearly all goiters of this type become toxic if the patients live long enough—not all of them, but most of them. We have had shown to us very clearly by Dr. Coller that a certain percentage of these will become malignant later in life. Recognizing the fact that a large percentage become toxic and that a smaller percentage become malignant, I believe that we should look on a nodule in the thyroid gland exactly as we look on a nodule in the breast; that is, it should be removed in order to prevent the conditions that follow, which may prove of rather serious import.

DR. FRANK H. LAHEY, Boston: A very important point in this discussion is whether or not a malignant condition frequently arises in the multiple colloid adenomatous goiter or whether or not it is largely confined to the fetal type of adenoma. It will make a very difficult situation if it is true that malignant disease is common in the multiple colloid adenomatous goiter, because if one must operate in these cases for prophylaxis one will have a busy time in the endemic goiter region. On the other hand, in New England, living, as we do, close to the seashore, our problem is simplified, because the discrete, fetal type of adenoma stands out usually as a single tumor or makes the selection of cases simple, and also they are not great in number. On the other hand, in multiple colloid adenoma, even the question of separation of the fetal type of adenoma must be extremely difficult because it is so surrounded by the multiple colloid endemic adenomas, which probably are not true adeno-

mas. Certainly it is believed by a number of men, and it has been my experience, that fetal adenoma is the common type for malignant disease. We know that the mortality of the removal of fetal adenomas, including the entire group of intrathoracic and extrathoracic tumors, is only 0.56 per cent. If we could operate in cases of the discrete type early, there would be practically no risk because of the simplicity of the operation, and there would be no danger of malignant disease in at least this type of adenoma. Probably the explanation of these so-called malignant adenomas, as demonstrated by the German pathologists of the past, is based on the fact that the morphology of thyroid tumors is not linked up with the actual clinical occurrence of malignant disease. While Dr. Simpson has said that malignant disease occurs when one cannot find vessel ingrowth, nevertheless vessel ingrowth certainly should make us group all the cases in which it can be found as potentially malignant, to be carefully watched and followed for possible recurrences. Since we cannot make the clinical diagnosis until it is too late in the majority of instances, we can approach this problem at present only through the prophylactic removal of the discrete adenomas, and it can be done safely. Therefore this is not a dangerous teaching to spread over the community.

DR. W. H. COLE, St. Louis: We are very glad that Dr. Straus and Dr. Else brought out the relation of toxic goiters to certain kinds of infections. We also believe that this occurrence is too often and too striking to be merely a coincidence. We have been asked what our interpretation is of the hyperplasia which we see in the animals in which infections were produced. We cannot answer that question definitely, but we believe that this hyperplasia is an attempt to produce more secretion, and that if the supply of iodine is adequate, sufficient secretion is produced to supply the body in the presence of infections, without invoking a hyperplasia. Moreover, the secretion produced by the hyperplastic tissue may have a diminished physiologic value. It is a fact that the animals to which iodine was given were not as sick as those to which iodine was not given. However, we are scarcely willing to accept this interpretation dogmatically from such a small series of experiments, but the iodine nevertheless did protect the glands of the animals in which infections were produced. Dr. Straus asked whether iodine was advisable in certain respiratory infection to prevent complications. Again we hesitate to make any dogmatic answer. The fact still remains that the iodine does protect the glands. We are quite sure of that, but whether the iodine should be advised in infections we are reluctant to say at present.

DR. FREDERICK A. COLLER, Ann Arbor, Mich.: There is no doubt that it has taken clinicians discussing thyroid problems twenty years to use the same language. We have been lost in a maze of nomenclature rather than a maze of fact. Most of us have meant the same thing, but we have been using a different language in describing the facts. I think that pathologists are in about the same position now. I do not think that there would be any great difference of opinion as to facts if they would all look at the same goiter that was removed or look at the same sections of the goiter. I am glad that Dr. Else stressed the dangers of these adenomas. Certainly a very small number of them eventually undergo carcinomatous degeneration. But since the taking of basal metabolic rates has become so common, I think it has led some of us into a false point of view. I see very frequently, in fact almost every day, patients with marked hyperthyroidism associated with adenomas, who at the time I examine them have gross cardiac injury, or occasionally very definite carcinoma. These have been watched for years and nothing has been done, because their basal metabolic rate was normal at the time they were seen. I think we must recognize that in this small but definite group we have been discussing carcinoma does develop. But far more important is this: I have never seen any adenoma disappear with any form of treatment aside from surgical removal after the age of 25. In any group of these cases, one will find that between 20 and 30, approximately 10 per cent will develop symptoms of hyperthyroidism; between 30 and 40, 35 per cent, and between 40 and 50, 36 or 37 per cent; after 50, a very definite number will develop symptoms of hyperthyroidism. The incidence of cardiac injury in this group is great. How great will depend on the observer, but in the literature it runs from 25 to 50 or 60 per cent of patients with gross cardiac injury. When to this one adds the small but definite incidence of carcinoma occurring in these glands, there can be no apparent reason for removing these glands until carcinoma, cardiac injury, or hyperthyroidism appears. We advise surgical removal of these adenomas after 25 whenever the diagnosis can be made.

DR. L. W. SMITH, Boston: I think that the chief point has just been brought out by Dr. Coller. It is a question principally of confusion in nomenclature. The salient point perhaps in which we differ is in respect to the question of terminology; i. e., sarcoma versus carcinoma. What we call those tumors does not particularly matter from the clinician's standpoint, and it certainly doesn't matter from the patient's standpoint. I think that it is a question which pathologists have to settle among themselves from an academic standpoint.

SURGERY OF THE PHRENIC NERVE AND INTRAPLEURAL PNEUMOLYSIS

E. J. O'BRIEN, M.D.
DETROIT

In the treatment of pulmonary tuberculosis, under the old regimen of watchful waiting, in which patients were kept at bed rest until their disease had advanced so far that only the more drastic surgical procedures were of benefit, phrenic nerve operations were not often employed.

Since it has become clear to all physicians that early compression of some sort should be used in unilateral lesions to assist in their arrest before the disease has spread to the other lung, phrenic crushing and exeresis have taken their places along with artificial pneumothorax as valuable and necessary methods of treatment.

Operations on the phrenic nerve are performed to cause a paralysis of the diaphragm, this paralysis being made temporary or permanent by the choice of procedure. Paralysis of the diaphragm will be caused by simple cutting or crushing of the phrenic nerve and its accessory, which exists in about 20 per cent of cases, but the nerve will regenerate in five or six months and the diaphragm will resume its function. If a permanent paralysis is desired, the entire nerve, or at least a segment of it, as well as the accessory must be removed. The former procedure is called phrenicotomy and the latter phrenicectomy or phrenic exeresis.

Paralysis of the diaphragm causes it to thin out and rise into the chest, stops its pumping action, releases elastic tension of the lung due to negative pressure within the thorax, and also the pull of contracting fibrous tissue, and gives added rest and compression by the upward force of intra-abdominal pressure.

Artificial pneumothorax can be used in many of the conditions in which phrenic operations are indicated, and in many cases it must be given the preference. However, in those cases in which it seems that either procedure may be used with equal benefit, in my opinion phrenic nerve operations are more desirable. They are performed in a few minutes under local anesthesia with little or no danger in experienced hands, and the patients can in most cases continue their bed rest without further interruption. But pneumothorax once begun must be continued from one to five years with constant refills, which are burdensome to the patient.

I am of the opinion that practically every patient with a unilateral tuberculous lesion should be given some form of compression therapy and almost none of them left to bed rest alone. The fact that many lesions clear up without it does not change the fact that many of them do not nor that more of them would do so in a much shorter time if it were given. Physicians owe

it to their patients or to those responsible for them to restore them as independent members of the community as soon as possible. In patients in whom lesions clear up without compression, rest is the predominant factor and, as compression gives added rest, physicians have no right, in my opinion, to withhold it if this can be accomplished without injury to the patient.

Even in the most innocent looking lesions, a crushing of the phrenic nerve gives much more assurance of their healing and is almost without danger if done by experienced hands. As the nerve will regenerate in five or six months, as has been stated, function will not have been lost but the patient will have had the benefit of its compression during that time.

Crushing should always be used, in my opinion, in minimal lesions not active enough to warrant collapse with pneumothorax but in which the added rest will give more assurance of their healing.

In patients with soft, exudative, rapidly spreading lesions, phrenic operations should not be considered. They should be given treatment by pneumothorax as soon as possible; but if the same lesion is seen after the activity has subsided and only a soft walled cavity remains, a crushing may be done. The lesion just described is attempting to heal by excavation and often the compression afforded by this procedure will suffice to cause its healing. After the crushing, frequent check-ups by means of x-rays should be made, and if the diseased area does not clear up readily or if reactivation commences, a pneumothorax should be added at once.

In uncontrollable hemorrhage, even in bilateral lesions, if pneumothorax is not possible, crushing should be done on the side where the bleeding occurs. Of course, if the disease here is unilateral and extensive, an exeresis should be done.

Crushing is used before upper stage thoracoplasty for apical cavities containing a considerable amount of positive sputum if there is no disease in the remainder of that lung. Here it will give temporary compression to the lower lung while the chest wall is being dropped on the cavity, giving added protection against aspiration pneumonia without permanent loss of diaphragm function.

It is also indicated in those cases in which compression of a diseased lung is desirable and in which there is a suspicious lesion in the so-called good lung that it has not been possible to test out with pneumothorax because of the absence of free pleural space. It is a well known fact that if these suspicious lesions are activated following compression, such activity occurs soon after compression has been started. Therefore, while pneumothorax would have been preferable because it is possible to discontinue it at any time and remove the air if activity occurs, a phrenic crushing, because of its temporary effect, is to be preferred to exeresis.

When, in extensive lesions in one lung there has been a spread to the good lung, bed rest should be started if the patient is not already in bed, in the hope that the spread will clear up, giving one a chance to do something to the more diseased lung later. However, if in these cases, after a prolonged period of bed rest, a recent spread to the other side is found, it seems improbable that further bed rest will be of use and some form of compression should be done on the more diseased side as a last resort in the hope that it will clear up both lesions. Pneumothorax should be used here if possible, but if this is impossible a crushing should be done.

In early nontuberculous lung abscess in which there is free bronchial drainage with considerable foul-smelling sputum that is not clearing up after four or five weeks of bed rest, postural drainage and bronchoscopy, crushing should be done to give added rest and compression and to prevent chronicity of the abscess and bronchiectasis.

Phrenic exeresis should be done in unilateral tuberculous lesions that are not very active but are more extensive than those in which a crushing is indicated. These lesions are usually of the productive or mixed type not active enough to warrant pneumothorax.

It should also be done before a lung having an extensive lesion is allowed to reexpand after being kept down with pneumothorax for a period of several years. The fibrous tissue formed to heal this lesion will often contract the lung to such an extent that it may never again be able to fill the thoracic cage, and the phrenicectomy, in lessening the size of the hemothorax, will give the lesions added protection against reopening when the lung is allowed to expand.

In old fanlike mixed lesions at the apex, with or without cavity, that can rarely be controlled by pneumothorax, it is especially beneficial.

In the soft walled, infraclavicular cavities left after an active exudative lesion has attempted to heal by excavation, an exeresis is occasionally done if it seems that the lesion is too extensive to heal before the diaphragm would resume its function if crushing were done.

In the much feared basilar tuberculosis, I have seen startling results from phrenicectomy; but these lesions must be watched carefully afterward and, if the process is spreading, pneumothorax should be added.

Phrenicectomy is used as an adjunct to pneumothorax when adhesions to the lateral wall or apex prevent proper collapse of cavities—especially if the base of the partially collapsed lung is adherent to the diaphragm and it seems that the ascent of the diaphragm into the chest will relax them and allow a continuation of the pneumothorax to cause further collapse of the lung.

In cases without apical or lateral adhesions but in which proper collapse of a cavity cannot be made with pneumothorax because the cavity is in the lower lung field and the base of the lung is adherent to the diaphragm, I have seen excellent results with added phrenicectomy.

It is also indicated as a preliminary measure to upper stage thoracoplasty for an apical cavity throwing off considerable sputum—in which there is a lesion in the remainder of that lung. It is done here to compress the lower lung field as an added protection against aspiration pneumonia and to give compression and rest to the whole lung, putting the patient in better condition for the more serious operation. It also gives a test of the other lung, and, as a complete thoracoplasty will be done here anyway, the loss of diaphragm function adds to the immobilization of the lung and is to be desired.

In old chronic lung abscess with free bronchial drainage and in bronchiectasis, phrenicectomy should be done before more radical procedures are used. It occasionally happens that further measures are not necessary.

Decisions as to the exact procedure in each case cannot be made easily. There is no other field of surgery, in my opinion, in which such close cooperation is necessary between internist, pathologist, roentgenologist and surgeon. No decision is ever made in our clinics except in conference with the entire staff. However, the general rules that have been given here can be applied.

In a small percentage of patients undergoing treatment by pneumothorax, bands of adhesions between the lung and the chest wall are found that prevent proper collapse of cavities, and as the results from compression therapy in cavitation will be almost in direct proportion to the success in obliterating them, an attempt may be made to cut the adhesions and allow a more perfect collapse. Many small thin adhesions are encountered that can be stretched gradually by frequent refills of small amounts of air, and sufficient collapse obtained. This is especially true if phrenicectomy has been added. In my experience, it is only the thick adhesions that defeat one's purpose. Cutting of the adhesions (intrapleural pneumolysis) may be done either by the closed method of Jacobaeus or by the open method. As it is usually the larger thick adhesions, in the cases under my observation, that prevent collapse and as they are more safely cut by the open method, I prefer this and have had excellent results with it; but Dr. Matson, who is so proficient in the use of the closed method, employs it almost exclusively with excellent results.

I believe that most of the failures attributed to the open method are due to the fact that the pleural cavity has been opened by an incision between the ribs. I attempted this route once and found that because of the extreme thinness of the pleura it was impossible to suture it properly when the operation was finished, for air escaped even through needle holes, the pleural space was lost, and the lung reexpanded and could not be put down again.

To overcome this difficulty, I now make my incision down to the rib nearest the adhesion to be cut, remove from 6 to 7 cm. of it subperiosteally and, after assuring myself that there is perfect hemostasis, make an incision through the periosteum and pleura, giving tissue of greater thickness to suture. This can be sutured tightly and pneumothorax will not be lost.

Perfect illumination of the pleural cavity may be procured during this operation if a small sized Cameron light is inserted in the cavity.

A tonsil needle is used to place sutures around the adhesions and, after these have been tied securely, the adhesions are severed by cautery, the lung immediately drops and the wound is closed.

Not enough cases have been reported as yet in which open pneumolysis has been done to permit a comparison of its results with thoracoplasty in these cases, but I believe that it should be given a more thorough trial.

I have not entered into the technic of phrenic operation, as this can be found in numerous articles on the subject. I have stated that it is a comparatively harmless procedure in experienced hands, but I wish to warn those who are not entirely familiar with it that they will encounter a great many anomalies. I have carried out this procedure more than 150 times and each time it seems different. One must be careful not to injure the thoracic duct, the large vessels, the brachial plexuses, and the sympathetic nerves. I believe that the incision should be made at least an inch above the clavicle to keep as far as possible from the thoracic duct, extreme care being used in blunt dissection until the transverse vessels of the neck are located. I have not had any untoward results in my entire series, although I did once encounter a hemorrhage from the transverse vein of the neck, which, however, was controlled and did not cause any ill effects. The higher the incision is made, the less danger will be encountered, but I find that more anomalies exist in this region. Phrenic nerves vary in diameter from the size of a thread to slightly larger than the lead of a pencil. Pain in the shoulder when the nerve is grasped cannot be relied on to establish the identity of the nerve. Phrenic crushing is more difficult than exeresis because one must be sure here to locate the accessory nerve, if there is one, as failure to crush both nerves will defeat the purpose of the operation. However, in exeresis it is sufficient to find the main phrenic nerve and remove it below the junction of the accessory.

305 Professional Building.

Clinical Notes, Suggestions and New Instruments

PERENNIAL HAY-FEVER DUE TO PARROT FEATHERS*

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History.—Mr. F. R., aged 30, consulted me, Sept. 23, 1924, for the relief of perennial hay-fever, with which he had been troubled during the preceding nine months. The symptoms started in January, 1924, with a running nose, pronounced irritation of the eyes and nose, and a feeling of fulness in the head. These symptoms became progressively worse until the patient had an almost constant, clear watery discharge from both nostrils. He felt much better while outdoors. He was treated by his family physician, and also by a competent nose and throat specialist, without relief. He then went to New York and took some sort of light treatments, which he felt helped him a great deal, but only temporarily. The only real relief that he had experienced since the disorder started was during the month of July, which he spent in Atlantic City, where he was entirely free from the disease. He had never had eczema, asthma, urticaria or migraine, and the family history was also completely negative for allergy. He had never noticed that eating any particular food or coming in contact with animals, plants or powders disagreed with him or aggravated the condition in any way; nor did he have the faintest idea as to the cause of the hay-fever. He had had a pet parrot at home for about two years. He was no more than normally susceptible to "colds." His temperature was subnormal.

Sensitization Tests.—Ninety-seven cutaneous tests with food, animal epidermal, stock bacterial and pollen proteins, were all completely negative with the exception of a positive reaction to parrot feathers. This finding checked perfectly with the history. The relief he had obtained in New York and Atlantic City was not the result of light treatments or climatic influence but was due entirely to getting away from the parrot. For the same reason, he felt better outdoors. On closer questioning, he told me that he was so fond of the parrot that he even took it in the shower-bath with him. I advised him, of course, to get rid of the parrot as soon as possible.

Result.—Two days after he had parted with his feathered friend he was free from all symptoms of hay-fever and has remained entirely well up to the present time, a period of more than four years.

COMMENT

This case of perennial hay-fever due to an unusual sensitization illustrates the importance of taking a careful history, as it is extremely unlikely that parrot feather protein would be included in routine sensitization tests.

Dr. George Piness[1] of Los Angeles has recently reported an interesting case of bronchial asthma in a man sensitive to parrot feathers. In the patient of Dr. Piness, however, the sensitization to parrot feathers was not clear cut, as he was also found sensitive to chicken, duck, egg yolk, cat hair, chicken feathers and house dust. The suspected foods were eliminated from his diet, and not only were the parrots disposed of but feathers of all types were eliminated from his home. Iodides and a cough mixture were prescribed. Furthermore, although the patient was greatly benefited, he was not completely relieved.

1801 Eye Street, N.W.

* Read before the Georgetown Clinical Society, Dec. 18, 1928.

1. Piness, George: Bronchial Asthma: An Unusual Sensitization and Its Clinical Significance, J. A. M. A. 91: 319 (Aug. 4) 1928.

Special Article

OCCUPATIONAL POISONING IN MANUFACTURE OF LUMINOUS WATCH DIALS

GENERAL REVIEW OF HAZARD CAUSED BY INGESTION OF LUMINOUS PAINT, WITH ESPECIAL REFERENCE TO THE NEW JERSEY CASES *

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Because of recent newspaper publicity, the result of litigation, and the publication of scientific and lay articles, some erroneously explaining and others denying the existence of the so-called radium poisoning in watch dial painters, it seems advisable that a review of the history, symptomatology, pathology, prognosis, treatment and scientific literature of this industrial hazard, first adequately described by me and my associates, be published at this time.

At a recent conference concerning a national survey of the watch industry for evidence of similar cases of poisoning in other states, I was greatly surprised when a leading authority on industrial diseases told me that this disease was an obscure one about which little was known. I cannot agree with this statement. In fact, its etiology, general and special symptomatology, pathology, prognosis and treatment were rather fully covered in our original work in 1925,[1] and at the present time there has been little of importance added to that description.

While the exposure and the study of this new industrial hazard is of prime importance to the watch industry, to all workers with radioactive substances, and to those exposed to penetrative radiation and irradiation from gamma and roentgen rays, its chief scientific interest is that this is the first time that the deadly alpha rays have been known to act continually on such vital centers as the blood-forming organs. All the previous evil effects of radiation recorded have been mainly penetrative in character by beta and especially gamma rays, by roentgen rays, or by the inhalation of emanation. Its main importance in pathology is that it adds additional information to the knowledge of the obscure anemias and the understanding of the hematopoietolytic systems.

NUMBER OF GIRLS EXPOSED IN THE NEW JERSEY CASES

During the years from 1917 to 1924, an accumulative total of about 800 girls were employed in a factory in New Jersey painting the dials of watches and clocks with luminous paint. In the busy periods there were never more than 250 girls working at one time. Many of the girls did this work for only a short period. The pay was attractive and the work comparatively easy. It is important to note that the known cases of radium poisoning all affected the girls who had worked steadily in this plant for from one to two or more years.

Among these employees there have been fifteen known deaths in which the so-called radium poisoning is strongly suspected. It was proved to be the cause of death in five cases. That other deaths have occurred is not at all unlikely. The late development of symptoms, often occurring from one to seven years after the patients leave the employment, and their resemblance to various other diseases would make a diagnosis almost impossible if the patients had moved to another locality. Physicians not aware of this condition might treat a victim for sepsis, anemia, Vincent's angina, rheumatism or "God knows what." How soon the true state of affairs would come to light would depend on the physician and the facilities at his disposal.

When one estimates the number of girls who worked steadily at this employment for a considerable period of time and realizes that most of the fatal and severe cases came from this group, it will be seen that the incidence of this poisoning compares with that of most other forms of occupational poisoning. For instance, in phosphorus poisoning among match makers, only 1 per cent of those working in Great Britain developed necrosis of the jaw and from 1 to 3 per cent in France and Switzerland. One of the great medicolegal questions raised against the radium-mesothorium cases being occupational was, Why did not a larger number of the girls become affected? Carelessness in handling poisons, individual susceptibility, individual resistance, habits and length of exposure all play important parts in occupational poisoning, and some are not thoroughly understood. There is no way of ascertaining in these cases how many have lost their lives and how many have been permanently or temporarily harmed.

LUMINOUS PAINT

General Principles and Theory.—Lind[2] states that while the general principles of the preparation of luminous paint have been described and known for some time, the actual methods of preparing phosphorescent zinc sulphide have not been fully described in the literature, and the methods in commercial use have been carefully guarded. The following quotations are selected from the excellent summary by Lind in his book on the alpha particle:

> Certain substances, under the influence of various kinds of radiation, emit light of visible wavelengths at ordinary and at extremely low temperatures. . . . In the radium luminous paints, radium salts are intimately mixed with phosphorescent zinc sulphide, which mixture is then applied to the dial to be illuminated. These mixtures have come into extensive use on watch and clock dials, electric push buttons, etc., and during the war were widely used for illuminating dials on aeroplanes, battleships, or in any place where it is desired to have a feeble light not visible for more than a few yards.

This luminescence depends on the phenomenon known as scintillation, discovered by Sir William Crookes[3] in 1903. It is due to an alpha particle which consists of a helium nucleus containing two positive charges striking the crystalline, phosphorescent zinc sulphide and causing a flash.

> Scintillations can be individually observed and counted only when the number of alpha particles falling on a given area of the screen in unit time is limited. When the number is greatly increased the screen appears to the eye to be uniformly illuminated, while under the microscope the number is too great to be counted.

The nature of the reaction furnishing the light is not thoroughly understood. Rutherford[4] proposed the theory that a

* From the pathologic department of the City Hospital, Newark, N. J., and the office of the Chief Medical Examiner of Essex County, N. J.

1. Martland, H. S.; Conlon, Philip; and Knef, J. P.: Some Unrecognized Dangers in the Use and Handling of Radio-Active Substances: With Special Reference to the Storage of Insoluble Products of Radium and Mesothorium in the Reticulo-Endothelial System, J. A. M. A. **85**: 1769 (Dec. 5) 1925.

2. Lind, S. C.: The Chemical Effects of Alpha Particles and Electrons, ed. 2, New York, The Chemical Catalog Company, Inc., 1928, pp. 61-68.

3. Crookes, William: Proc. Roy. Soc. **71**: 405, 1903.

4. Rutherford, E. E.: Proc. Roy. Soc. **83**: 561, 1910.

phosphorescent substance contains initially a large number of "active centers" or molecular aggregates which are disrupted by alpha particles with the emission of light. Rutherford has calculated that a single alpha particle destroys all the centers in its path within a radius of 1.3×10^{-7} cm. for ZnS.

Without going into further detail, it becomes apparent that after the luminous paint has been applied there will be a constant decrease in luminosity as weeks and years go by, owing to a decay of the zinc from constant disruption by the bombarding alpha particles and also to weakening in the radioactive substances used by reason of their natural and uninfluenceable decay. In the average watch this luminosity is greatly impaired in about three years with the radium-mesothorium mixtures.

On account of the long life of radium (half period rate 1,750 years) and the consequent waste in applying it to a dial the use of which is limited to a few years, Moore,[5] in 1918, proposed that the corresponding member of the thorium series, mesothorium, be used, which has a half period of 6.7 years. Mesothorium paints have come into general use and have proved effective for a period sufficient for all practical purposes. Mesothorium itself emits no alpha radiation, which must be generated by the growth of radiothorium with a half period of 1.876 years, which involves the disadvantage of requiring the "ripening" of mesothorium salts for one or more years before using, but the advantage that, if used before alpha radiation attains a maximum, its growth will, in part, compensate the deterioration of the ZnS. The use of radiothorium for luminous paints has become common in the watch industry.

In the manufacture of luminous paint the preparation of the phosphorescent zinc sulphide is most important. The phosphorescent qualities of zinc sulphide (Sidot's blende,[6] hexagonal ZnS) depend on its proper treatment by heat and on the presence of certain impurities. "The heat treatment consists in raising the ZnS mixture for a limited time out of contact with the air to a temperature at which incipient crystallization begins." From 900 to 1,100 C. at least is necessary for the best results. The crystalline structure should be distinct after cooling. It was found, too, if the "ZnS was pure that the heat treatment would not develop any phosphorescent properties towards ordinary light and only a faint luminescence under large quantities of radon unless certain impurities were added. . . . The admixtures which have been mentioned as advantageous are manganese, copper, or bismuth salts, sodium chloride, and salts of rare earths." These are added in very minute quantities. Neutral salts are often added to camouflage the presence of the effective agents.

Character of the Paint Used.—Of course the detailed preparation of the paint used in these cases has for purely commercial reasons never been published. It is possible, even probable, that its ingredients and formulas change from time to time. According to my information, however, an average paint used during this period on watches consisted mainly of crystalline zinc sulphide (ZnS, Sidot's blende) mixed with various proportions of radium, mesothorium and radiothorium in order to obtain the desired amount of luminosity. The pure zinc sulphide was prepared by repeated roastings and reprecipitations, and to this was added small amounts of cadmium, copper and manganese to give better luminescence. To this emulsion a soluble radioactive salt was added which was then precipitated out as an insoluble sulphate by the alkaline sulphate. The fact that the final paint contained radioactive substances in the form of insoluble sulphates is of extreme importance throughout the study of the whole disease, and the prognosis and treatment depend chiefly on this fact. Radium sulphate is from one to two hundred times more insoluble than barium sulphate, and the latter is soluble only with great difficulty.

"Paints applied to watches and clocks contained an average of 1 mg. of radium element or its equivalent to 30-40 Gm. of zinc sulphide." Flinn [7] has stated that the strengths of the paints used varied from 0.7 to 3 and 4 mg. of radium element to 100 Gm. of the zinc sulphide. This practically agrees with the estimated strengths given by us [1] in 1925. Flinn [7] has also stated that the amounts of impurities added to the zinc sulphide were: cadmium, 0.05; copper, 0.001, and manganese, 0.0002 per cent. This is given to show that no toxicologic effects might be expected from such small amounts of these substances, none of which have ever played a prominent rôle in industrial toxicology.

In the beginning, the zinc sulphide was rendered luminous by activation with radium. Later, for economic reasons and because of greater practical luminosity, mesothorium and radiothorium were substituted for the more expensive radium. The mesothorium contained radiothorium in equilibrium, or artificially added, to obtain maximum ionization and luminosity.

The paint used by the girls contained, therefore, chiefly zinc sulphide rendered luminous by activation with about 20 to 30 per cent of radium and from 80 to 70 per cent of mesothorium containing radiothorium. But doubtless this percentage varied from time to time. This is most important in view of the fact that later, in the extraction from the bones in the fatal cases, mesothorium and its decay products were found greatly in excess of the radium in four of my cases, while in the case recorded by St. George and Gettler only radium was found.

In addition, the preponderance of mesothorium is of great toxicologic importance, since we [1] called attention in 1925 to the fact that mesothorium in equilibrium with its radiothorium emits five alpha particles, whereas radium emits only four, and that the alpha particles of mesothorium and its decayed products have a greater velocity and penetration than those of radium, and therefore are chemophysically and physiologically more active.

As to whether certain ingredients of the paint other than the radioactive substances were responsible for the symptoms in these cases, it may be stated that there is no previous knowledge or record of chronic poisoning due to the cumulative effects of zinc, copper, cadmium and manganese showing anything like the clinical pictures seen in these cases.

As zinc is the main chemical constituent of the paint, it is, of course, under suspicion. However, it is generally conceded that zinc per se is nonpoisonous.[8]

Michaelis [9] asserts that zinc is a normal constituent of human tissues. The most common type of zinc poisoning in industry is that due to the inhalation of fumes and ingestion of dust during the process of smelting and vaporizing impure zinc known as spelter; or of smelting brass which contains about 50 per cent of zinc. "Spelter chills" and "brass founders' ague" are characterized by chilly sensations, rigors, pains in

5. Moore, R. B.: Bull. Am. Inst. Min. Met. Engs., August, 1918.
6. Sidot, T.: Compt. rend. Acad. d. sc. **63**: 188, 1886.

7. Flinn, F. B.: Radioactive Material an Industrial Hazard? J. A. M. A. **87**: 2078-2081 (Dec. 18) 1926.
8. Rambousek: Industrial Poisoning, translated by Legge, 1913, p. 151.
9. Michaelis, quoted from Hill in the Reference Handbook of Medical Sciences **8**: 339.

the limbs, diarrhea and prostration quite unlike anything seen in these cases. While longevity may be shortened in these occupations there is no evidence of any direct cumulative effect. I have been informed by Wilbur,[10] who for years was physician to the New Jersey Zinc Company, one of the largest zinc mines and extracting plants in the East, that he had never seen any ill effects from zinc, even in the zinc sulphide department, in which men were constantly exposed to large amounts of zinc dust by inhalation and ingestion. There have been cases of manganese poisoning. The ore at this mine is practically free from arsenic and lead but contains considerable manganese. These cases were described by Casamajor.[11] They were characterized by the development of a clinical picture not unlike that seen in paralysis agitans or the late manifestations of epidemic encephalitis. As the cases appeared before 1913, epidemic encephalitis as an etiologic factor is ruled out.

There is considerable doubt as to whether a chronic poisoning from copper exists. Such cases as are reported are usually due to impurities from phosphorus, arsenic, antimony, lead or mercury. Whether copper per se is toxic is still unsettled. It is worthy of note, however, that Mallory, Parker and Nye [12] have shown that hemochromatosis is due to chronic copper poisoning. They have produced experimentally pigment cirrhosis by feeding copper salts. Of course, the symptoms of this disease and its pathology do not have any resemblance to those of radium poisoning.

The reported cases of cadmium poisoning occurred chiefly in the smelting of zinc, and the main symptoms were referable to the gastro-intestinal tract and peripheral nervous system. They usually resemble cases of lead poisoning but there is no typical colic.

Mode of Application of Paint.—The paint was mixed with acacia and thinned out with distilled water, and was given to each girl in a porcelain crucible containing about 10 cc. of the mixture.

It was the habit of most of the girls, who were doing piece work, to point the camel hair brushes used in painting with their lips, as quicker and more accurate painting could thus be performed. We had assumed in 1925, as a basis for argument, that a girl painting 250 watches a day and licking her brush once for each dial might possibly ingest a minimum of about 125 mg. of the paint. If she pointed her brush fourteen times per dial (one girl stated that she often licked her brush twice for each watch figure), she might ingest about 1.75 Gm. of paint a day. Working throughout the week, it was possible, therefore, for a girl to swallow from 15 to 215 micrograms of radioactive substances during a week.

The only other estimate known was made by Flinn,[7] in 1926, one year after our publication, in which he stated that assuming that a girl used about 10 Gm. of paint a week, or more, depending on the work, she might ingest, if she was careless, 0.5 Gm. for every 10 Gm. of paint used, or about 0.5 Gm. of paint a week, which would contain about 7.2 micrograms of radioactive substances. His estimated amount is about one half of our estimated minimum. Of course, these are only guesses. The important facts are that he admits the licking of the brushes and the possibility of ingestion of a paint containing radioactive substances, further stating that from 15 to 20 micrograms might remain in the intestinal tract continually if the girl was working steadily.

Hoffman,[13] in May, 1925, was the first to call attention to this habit of licking brushes. Speaking of twelve cases that he reported, he states:

> There is some question of doubt as to whether they were instructed to do their work this way or whether they worked contrary to instructions. They certainly seem to have copied the habit one from another, and found it decidedly convenient, the brush being better adapted to the purpose when penciled to a fine point with the lip.

He also stated that the paint contained mesothorium.

CHRONOLOGICAL ORDER OF EVENTS IN THE NEW JERSEY CASES

Early Deaths.—In 1922, 1923 and 1924, nine girls died who had been employed as watch dial painters in this plant and who had worked steadily for years at this employment.

Absolutely no investigations were made in any of these cases as to the cause of death. The death certificates were signed by the family physicians and some of the following conditions were given as the cause: ulcerative stomatitis, syphilis; primary anemia, Vincent's angina; phosphorus poisoning, necrosis of the jaw; occupational poisoning (character unknown), necrosis of the jaw; anemia, necrosis of the jaw. It is impossible to obtain any data in these cases as to the special symptomatology, or any blood studies on the type of anemia. Autopsies were not performed. In fact, except for slight suspicion on the part of a few family physicians that something was wrong, no medical recognition of the existence of an occupational poisoning was recorded. The material represented by these cases is therefore wasted with the exception of one case. In this case, which was one of the first to terminate fatally in 1922, the body was exhumed five years after death for litigation purposes. Gettler found undisputed evidence of radioactivity in the bones.

Treatment by Dentists.—During this time, local dentists were treating a considerable number of girls employed, or who had been employed, by this plant for various degrees of jaw necroses, many of which were resistant to the usual forms of treatment. There is no way of determining the number of girls treated, but the assumption of about fifty would not be an exaggeration.

First Recorded Suspicion of the Existence of an Occupational Disease.—Blum,[14] a New York dentist, is to be credited with the first report indicating that an occupational form of poisoning existed. He reported in September, 1924, a case of unusual and intractable osteomyelitis of the mandible in one of these girls. He knew nothing regarding the nature of the paint or industry, but thought from the unusual clinical behavior that some sort of occupational poisoning existed.

Investigation by Lay and Civic Bodies.—In 1924, the Consumers' League of the Oranges called the attention of the state department of labor to the objectionable fumes coming from the plant, and the possibility of an occupational poisoning. An investigation was made but with entirely negative results. The U. S. Public Health Service had briefly considered the matter but did not make an investigation.

10. Wilbur, Frederick: Personal communication to the author.
11. Casamajor, L.: Fifteenth Int. Cong. on Hygiene and Demography, part 2, **3**: 574.
12. Mallory, F. B.; Parker, Frederick, Jr., and Nye, R. N.: Experimental Pigment Cirrhosis Due to Copper and Its Relation to Hemochromatosis, J. M. Research **42**: 461 (Oct.-Dec.) 1921.
13. Hoffman, F. L.: Radium (Mesothorium) Necrosis, read before the Section on Preventive and Industrial Medicine and Public Health, May 29, 1925.
14. Blum, Theodore: Osteomyelitis of the Mandible and Maxilla, read before the American Dental Association in September, 1924.

The Hoffman Report.—In 1925, Hoffman, whose attention was called to the plant by the New Jersey Consumers' League, found that there was a great similarity in the reading of the death certificates of deceased former employees. Most of them mentioned jaw necroses, anemias and buccal lesions. He thought that from a statistical standpoint the matter should be investigated. In May [15] and September,[13] 1925, he reported, from the statistician's point of view, five deaths and twelve cases occurring among girls still alive who had developed a resistant infection of the jaw with buccal lesions and a marked anemia. He was of the opinion that they represented an unusual occupational poisoning, and thought that mesothorium in the paint was mainly responsible and that there was an ingestion of this paint as a result of the habit of licking the brushes. This is the first recorded report of the nature of the disease. In the investigation he was greatly aided by the experience of von Sochocky, who was intimately acquainted with conditions at the factory. No description of the types of anemia or other symptomatology was given, and as there had not been any autopsies there were no records of pathologic changes, and the subject was unproved.

The Castle and Drinker Report.—During this time the factory executives had undertaken an investigation of their own to determine whether any occupational hazard existed. This was made by Castle and the Drinkers [16] in March, 1924. Unfortunately, at the request of the company, this report was not published on account of threatened litigation until August, 1925. According to my information these investigators were asked to ascertain whether there was any evidence of zinc poisoning and to comment on the general hygiene of the plant. Nothing was told them about mesothorium. They inspected the factory and the employees and concluded that there was undoubtedly proof of excessive exposure to radiation. Sealed dental films when placed in any part of the factory showed fogging in from one to two weeks, and in the painting room in from two to three days, showing exposure to gamma radiation. The skin, dresses and underwear of many girls when examined in a dark room showed the presence of phosphorescent zinc sulphide and appeared luminous. Dust collected from the chandeliers, wall beams and even in the offices when exposed to light was luminous in the dark room, showing the presence of the zinc sulphide. Samples tested later for radioactivity were positive. While they considered the skin and gastro-intestinal tract as probable portals of entry, they concluded that undue exposure to radioactive substances existed, chiefly from the inhalation of particulate material containing a radium salt. They did not ascertain the presence of mesothorium. They stated that the habit of pointing brushes in their mouths had been general among the employees, but was stopped six months before the investigation started. They concluded that the implication was not proved, but the safest course would be to assume that an occupational poisoning existed. They made recommendations for the future protection of workers. The main value of this report is that it came from the factory's side and demonstrated without a doubt that all the girls employed as dial painters were subjected to excessive exposure.

First Patients Examined.—In May, 1925, I examined two girls with extensive jaw necrosis and severe anemia. Both patients died and I performed autopsies. At the same time I saw in consultation the company's physicist, who was suffering from a profound anemia, apparently of the regenerative type. He died soon afterward and I performed the autopsy. These were the first autopsies made in such cases.

Original Report.—In October, 1925, I [17] first reported the etiology, symptomatology, pathology, diagnosis and treatment of this new occupational disease. This report was based on the first two autopsies performed and the study of five living patients in whom a diagnosis of the condition was made for the first time by detecting emanation in their expiratory air. The method by which the radioactive substances entered the body, the chemical form in which they were ingested, the storage as insoluble sulphates in particulate form in the bones, liver and spleen, and the importance of the histiocytes of the reticulo-endothelial system in this storage, the methods of recovering them from the organs, their demonstration after death by photographic and electroscopic methods, their demonstration during life by means of the expiratory air test, the type of anemias encountered, the gross and microscopic pathologic changes of the disease and its prognosis and treatment were all described for the first time.

This work was based on my investigations as chief medical examiner of Essex County and was undertaken independently of all other investigations and according to my own views of what my duties were. One of the main functions of the medical examiner is to prevent the wastage of human life in industry. These investigations were unasked for and uninfluenced by any civic or other body. I feel that, as a result of this investigation, the disease was for the first time put on a firm scientific basis.

The Martland, Conlon and Knef Report.—In December, 1925, Conlon, Knef and I [1] enlarged on my original report, giving in detail the history, symptomatology, pathology and prognosis in this disease. Radioactivity was demonstrated during life by showing the presence of emanation in the expiratory air, and after death by photographic and electroscopic methods. The case of a girl apparently in perfect health was reported to show the difficulty in diagnosis; this girl had emanation in her expiratory air. At the present time she is a victim of chronic bone lesions of a crippling nature. The report gives for the first time a detailed recital of the disease, which picture is not likely to be added to or changed. Attention was called to the dangers of intravenous therapeutic injections of radioactive substances. Even when soluble bromides or chlorides of radium or mesothorium are used, they are precipitated in the blood stream as insoluble sulphates and may accumulate in the organs of the reticulo-endothelial system as fixed deposits.

Another Fatal Case.—In October, 1926, I [18] reported the death of another girl, described as having the disease in a chronic form in our [1] report, in whom a more careful chemical extraction from the bones showed a total of 150 micrograms deposited in the skeleton, of which about 70 per cent was mesothorium and its derivatives. Accurate photographic work was done and autohistoradiographies were made after the method of Lacassagne showing the irregular distribution of the

15. Hoffman, F. L.: Radium (Mesothorium) Necrosis, J. A. M. A. 85: 961 (Sept. 26) 1925.
16. Castle, W. B.; Drinker, Katherine R., and Drinker, C. K.: Necrosis of the Jaw in Workers Employed in Applying a Luminous Paint Containing Radium, J. Indust. Hyg. 7: 371 (Aug.) 1925.
17. Martland, H. S.: Some Unrecognized Dangers in the Use and Handling of Radioactive Substances, with Special Reference to the Storage of Insoluble Products of Radium and Mesothorium, etc., in the Reticulo-Endothelial System, read before the New York Pathological Society, Oct. 8, 1925.
18. Martland, H. S.: Microscopic Changes of Certain Anemias Due to Radioactivity, Arch. Path. & Lab. Med. 2: 465-472 (Oct.) 1926.

deposits in the bones. The character of the anemia was more minutely described.

The Reitter and Martland Report.—In August, 1926, Reitter and Martland [19] reported the death of a chemist and physicist employed in the same plant as the girls. Before protective measures were used, he openly handled radioactive substances, often being exposed to untubed radioactive elements. He had been exposed to radiation in the following ways: through inhalation of gaseous disintegration products of radium and mesothorium; through inhalation of dust particles in the atmosphere of a room in which products were weighed, tubed and retubed; through exposure to alpha, beta and gamma rays from solid preparations prior to sealing, and through exposure to gamma rays from hermetically sealed preparations. While at work and apparently in good health, the patient suddenly developed an acute leukopenic anemia of the regenerative type, dying one month after the onset of symptoms. This was the first case that I examined at autopsy in May, 1925, but unfortunately the report was held up at the request of the factory on account of threatened litigation.

The organs were tested by Barker, the chief physicist of the plant. He found 14 micrograms of radioactive elements in the skeleton. Approximately 5 per cent was due to radium, the remainder being made up of the alpha radiation from mesothorium and the decay products of radium and mesothorium. One microgram was recovered from the lungs (the main mode of entrance in this case). It was believed that this was the first case in which complete quantitative tests for radioactivity in human tissues had been made post mortem, although in 1913 Cameron and Viol [20] had made quantitative tests of the organs of a patient dying from cancer three and one-half months after the experimental intravenous injection of 1 mg. of radium element. The largest amounts were found in the bone marrow, liver and lungs. Reitter and Martland concluded that complete protective measures must be installed in all manufacturing plants, laboratories, hospitals and private offices in which radioactive substances are handled.

Flinn's First Report.—In December, 1926, Flinn [7] reported his observations in these cases. He describes the composition of the paint used and its method of application, and admits that it had been the custom to point the brushes, after dipping them in water, by drawing them between the lips.

He speaks of five deaths in the preceding four years among girls employed in this plant as dial painters, who had developed necrosis of the jaw following the removal of a tooth or dental intervention and accompanied by severe anemia terminating in death.

As regards the jaw necrosis, he argues that the gelatinous liquefaction noted in these cases suggests bacterial invasion and is in marked contrast to the bony disintegration seen in phosphorus poisoning. He does not believe that the necrosis can be explained by the lodging between the teeth or on the roof of the mouth of particles of radioactive substances, but does admit that particles may penetrate into the cancellous structure of the bone through open spaces caused by pyorrhea.

In his experimental work he has shown that when the girls used a cloth instead of their lips for pointing a considerable measurable amount of radioactive substance was deposited in the cloth after the brush had been washed in water. He believes, however, that, if this was swallowed, 98 per cent would be excreted in a few days after the exposure ceased.

He states that inquiries in this country and in Europe fail to reveal a single case of jaw necrosis outside the Orange cases, and that "the pointing of paint brushes in the mouth proved to be a common habit in all factories inspected here and abroad." Yet Lacassagne [21] has stated that the disease is not observed among the watchmakers of Switzerland and France because they use rods in putting the illuminating substance on dials.

Flinn concludes that "an industrial hazard does not exist in the painting of luminous dials. The only evidence contrary to this conclusion rests in the fact that five employees at the plant in Orange, N. J., have died from some cause that cannot be determined at this date."

He further states:

> The girls who died all worked together at the same bench some time between the years 1917 and 1923. A diagnosis of syphilis as a contributing factor appears on the death certificate of one of them. . . . A brother of another has suffered from an obstinate pathologic jaw condition. He never came into contact with radioactive paint. In other words, the cases were not clear cut. Vincent's angina has been known to produce a similar pathologic picture, ending sometimes in death. Bacterial infection has not been ruled out in a satisfactory manner. . . . The five cases reported suggest bacterial invasion and were complicated by syphilis, joint trouble and Vincent's angina.

The only reference made to the literature directly bearing on the cases was the Drinker report. The Flinn dictum beclouds the issue by confusing the jaw necrosis with that due to syphilis, Vincent's angina, phosphorus and arsenic, and the introduction of a peculiar bacterial infection that occurred in the girls because they worked in the same room and frequently used one another's brushes.

Concerning Vincent's angina, it has been my experience that death from this infection is extremely rare. Many of the cases reported are secondary infections with the organisms of Vincent superimposed on buccal lesions that have as their underlying cause an aplastic anemia, an acute leukopenic leukemia or similar conditions which have been unrecognized.

Flinn's work is of considerable importance, however, since at this time he admits that the girls pointed the brushes with their lips; that the paint used contained radium or mesothorium; that the method by which it was applied made possible the ingestion of small amounts of radioactive substances; that the girls in this particular plant worked a sufficiently long time to allow the ingestion of a considerable amount of the paint, and that, although 98 per cent of the radioactive substances ingested would probably be eliminated within a few days, a small amount remained in the body.

Flinn's Second Report.—In May, 1927, Flinn [22] reported the case of a dial worker in a Connecticut plant who was first seen by him in June, 1926. She had painted dials for fourteen months during 1921 and 1922. In 1924, she tripped and snapped a femur without actually falling to the floor. This had to be refractured and reset. When she was seen by him, a swelling was present over the ramus of the inferior maxilla on the left side which had followed the recent extraction of teeth for pyorrhea. A roentgenogram showed bone necrosis.

19. Reitter, G. S., and Martland, H. S.: Leucopenic Anemia of the Regenerative Type Due to Exposure to Radium and Mesothorium, Am. J. Roentgenol. **16**: 161-167 (Aug.) 1926.

20. Cameron, W. H., and Viol, C. H.: Classification of the Various Methods Employed in the Internal Administration of Radium Emanation and Radium Salts, Radium **4**: 66 (Jan.) 1915.

21. Lacassagne, A.: Un nouvel accident professionnel des manipulateurs de corps radioactifs: La necrose des maxillaires, Paris méd. **16**: 132 (Feb. 6) 1926.

22. Flinn, F. B.: A Case of Antral Sinusitis Complicated by Radium Poisoning, Laryngoscope **37**: 341-349 (May) 1927.

The expiratory air showed the presence of emanation. A gamma electrometer, when placed close to the body, showed gamma radiation, which was estimated as about 100 micrograms in the entire body. After the administration of ammonium chloride for four days, this was reduced to 86 micrograms. The patient had a low blood pressure. A profound anemia was present, characterized by slight anisocytosis, poikilocytosis and polychromatophilia. The hemoglobin was 35; erythrocytes numbered 3,100,000, and leukocytes 6,100, with 64 per cent polymorphonuclears. She developed suppuration in the antrum. After a heavy cold the condition became progressively worse and she died in January, 1927.

Autopsy did not reveal any other abnormality than that the bone marrow presented the same general condition that is found in chronic benzene poisoning.

This case was followed by a second one occurring in the same plant. Flinn says:

> In view of the evidence in front of me I feel that radium is partially if not the primary cause of the pathological condition described. . . . If the presence of small amounts of radium in the body will produce such profound systemic changes as to lower the body's resistance to the extent indicated in these cases, one cannot but view with alarm the intravenous injection or internal administration of radioactive material. If radium has affected any one who has had such treatments, the action of the radium may have been masked by the other complications. . . . It may be that a constant exposure of the hemopoietic system to these small quantities of radium may in time result in a lowering of the body resistance to infection. Radium deposited in the bone may bombard the marrow continuously with powerful alpha and beta rays.

Flinn's Third Report.—In January, 1928, Flinn,[23] in discussing some newer industrial hazards and in speaking of the radium cases, says:

> At the time the first case was referred to me from Connecticut, I had examined practically every girl now working in this industry in this country, and had others examined for me in England, besides making inquiries in other countries, and had come to the conclusion that the deaths in Orange might have been caused by some bacterial infection, especially as all the girls affected had worked at the same time in the same room. I was unable to find one case either in this country or in Europe, except those which appeared in New Jersey. I reported my findings in THE JOURNAL A. M. A., but before the article was published, the two cases occurred in Connecticut. . . . These two cases, appearing in another state from the first cases, have caused me to suspect that radioactive material is at the bottom of the trouble even if the mechanism by which it is caused is not altogether clear and not previously suspected.

It is worthy of note that not only were these cases suspected by Hoffman, Castle and the Drinkers in 1925, two and one-half years before these statements by Flinn, but the disease was accurately described in all its features by me and my associates two years before Flinn finally made the foregoing admissions.

Bone Sarcoma.—In March, 1928, I[24] recorded the death of another girl who had worked at this plant eight years before. Fourteen months before her death she fell and injured her right shoulder. Six months before death she developed an osteogenic sarcoma of the right scapula from which she died, following an operation for relief of pain. She had never had any severe jaw necrosis but had had evidence during life of a radiation osteitis in the right scaphoid bone, both humeri and the glenoid cavities. Autopsy showed an osteogenic sarcoma invading the muscles of the back, but no internal or bone metastases, and with this there was a profound anemia of the leukopenic regenerative type with the red marrow similar to that seen in the other cases of radium poisoning. It was estimated that her skeleton contained about 50 micrograms of radioactive substances in which mesothorium predominated. I interpret the sarcoma as possibly arising in a bone in which a previous radiation osteitis had existed for some time as a result of deposits in the skeleton. In reviewing the fifteen fatal cases I had found evidence that one of the early cases had been diagnosed as sarcoma of the femur from the clinical course and the roentgen examination, and had been treated by high voltage roentgen therapy. This was never proved, however, at autopsy. The incidence of two osteogenic sarcomas in fifteen patients dying as the result of an occupational poisoning by radioactive substances is too high to be mere coincidence.

DEATH, FROM APLASTIC ANEMIA, OF ORIGINATOR OF FORMULA USED AT NEW JERSEY PLANT

Nov. 14, 1928, Dr. Sabin A. von Sochocky died of an aplastic or aregenerative anemia. Von Sochocky had formerly been a technical director in the company in which these cases occurred. While the general principles of luminous paint are well known, each plant had its own formula which was a commercial secret. The paint used by these girls was mainly von Sochocky's formula.

From 1913 to 1921 he had been exposed to intense radiation from radioactive substances, during which time he had personally extracted about 30 Gm. of radium from the ore, being exposed continually to heavy penetrative radiation. He was exposed to the inhalation of dust in the crystallizing laboratories. From 1919 to 1920 he was exposed to heavy radiation in a small room from large amounts of emanation by inhalation and ingestion and to highly concentrated dust from radium, mesothorium, and the like. On four occasions he was exposed to explosions of tubes containing high concentrations of radium and mesothorium.

Since 1921 he had occasionally been exposed to external penetrative radiation from radium used for therapeutic purposes.

He had an extensive radium dermatitis of the fingers of both hands. He also had considerable jaw necrosis with buccal lesions, and at times was quite anemic. However, he was able to combat the anemia and buccal sepsis by hygienic measures and by living at times in high altitudes.

In 1925 he gave me considerable advice with regard to measuring the amounts of radioactivity in the bones at autopsy. In June, 1925, while testing some of the living patients and devising a technic for the expiratory air test as a control in one of our experiments, we tested his expiratory air for emanation and found larger amounts than in any of the living patients. Later, when he blew his expiratory air over a screen of phosphorescent zinc sulphide, scintillations were seen, too numerous to be counted. At this time he realized his condition and its apparent hopelessness but was stoical to the end.

He was in a fair state of health and able to do his work until August, 1928, when he became extremely weak, pale and dyspneic. Blood examination showed hemoglobin, 28 per cent; erythrocytes, 1,720,000; leukocytes, 4,000, with polymorphonuclears, 48 per cent. Blood platelets were scant. Practically no reticulocytes were present. The red cells were regular in size and shape and showed no polychromatophilia. From this

23. Flinn, F. B.: Some of the Newer Industrial Hazards, Boston M. & S. J. **197**: 1309-1314 (Jan. 12) 1928.
24. Martland, H. S.: Osteogenic Sarcoma of Scapula Occurring in a Woman Having Previous Radioactive Deposits in Her Body, read before the New York Pathological Society at the New York Academy of Medicine, March 8, 1928. To be published in full in Archives of Pathology.

time until he died, three and one-half months later, the clinical picture was typical of the terminal stage of an aplastic anemia. He was kept alive by thirteen blood transfusions given at intervals of from eight to three days, and in amounts from 450 to 900 cc. The transfusions would not hold more than four days and the last two were of no benefit. For two and one-half months his blood platelets were under 40,000 per cubic millimeter and practically absent in the smears. Yet aside from a fine purpuric rash over the extremities which would appear in crops, there was no bleeding until the last. On one occasion the icterus index was 6.8 and there was a slight indirect van den Bergh test. Blood cultures were repeatedly negative. Finally the leukocytes would vary from 1,800 to 2,500 with scarcely any polymorphonuclears near the end. Various forms of treatment, including large and extended use of raw and cooked liver and active fractions (liver extract), had no effect, the liver diet producing only an occasional reticulocyte in the blood smear. Just before death he developed a septic bronchopneumonia, retinal hemorrhages, hemoptysis and hematuria.

He died a horrible death, similar to that seen in chronic benzene poisoning, the acute leukemias and other acute blood dyscrasias. During the time I knew him he gave all that was in him to help and comfort others suffering from this disease. Without his valuable aid and suggestions we would have been greatly handicapped in our investigation.

LITIGATION

In 1926 two of the fatal cases in which I had performed the autopsy were settled out of court without the company assuming any legal responsibility. The families of the two girls received a lump sum of money approximately equal to what they would have received under the compensation act, which arrangement was to extend over a period of time. Of course, the attorney extracted his usual fee.

In May, 1927, suit was started in the supreme court by five girls said to be suffering from this disease. This was made known to the public through the newspapers as "The Case of the Five Women Doomed to Die." It is of great medicolegal importance and will therefore be briefly discussed. I had no interest in either side but was subpenaed by the plaintiffs as a county official, and refused to accept more than the sum of 50 cents customarily tendered with the service of a subpena.

I shall try to bring out the shortcomings of the present compensation law and show the impossibility of obtaining compensation for occupational diseases unless the disease is specifically included in the law.

After suit was started the defense pleaded that the statute of limitations [25] barred action and the women's counsel was compelled to transfer the case to the chancery court [26] in July, 1927. The case was continually postponed and no hearings were held until Jan. 12, 1928. After three days the hearing was adjourned to April 25, when it was again continued for three days. The plaintiff's case being in, further hearings were then put off until September 24. Shortly after an editorial appearing in the New York *World*, which stated that "this is one of the most damnable travesties on justice that has come to our attention," it was decided that the case never belonged in chancery and should go back to the supreme court for trial.

At last everything was ready for the trial, even the sob writers, when suddenly an uninvolved judge, out of the kindness of his heart, believing that there should be some relief for the girls and that the case might drag on for years in the courts, arranged a settlement out of court. The company again did not assume any legal responsibility that the cases arose from occupational poisoning. Great credit was given this judge for his very humanitarian act.

In a recent review, De Laet [27] cites the cases of the five New Jersey girls as the only known instance in which persons injured from the handling of radioactive substances have received compensation. He says that these cases have no medicolegal precedent.

The settlement is unique. The girls received a definite sum of money and will have a yearly pension as long as they live, or as long as a committee of three experts decides that they are still suffering from radium poisoning. One member of the committee was selected by the company, one by the girls and the third by the other two. Two members of the committee will constitute a majority. No mention was made of mesothorium and no explanation of the omission was offered.

Three of the five girls had been examined by me in 1925 and showed evidence of radioactive deposits in their bones and emanation in their expiratory air. At this time they were in rather good physical condition. In fact, one girl who we predicted might have trouble in the future was reported in our original paper [1] as a "healthy case" on whose life any insurance company would have issued a policy. This girl now has bone lesions of a crippling nature and a moderately severe anemia. Only one of the five girls has had any severe necrosis of the mandible. This patient still has jaw necrosis, which has already necessitated about twenty dental operations. At this time she has discharging sinuses below the chin which will not heal. Of the five girls it would seem that this one is the most likely to die, as the danger of added buccal sepsis is always present. In addition, she has had a destructive lesion in the lower part of the dorsal spine behaving clinically like Pott's disease but quite different roentgenographically. She also has an osteitis in the scaphoid bone of the left foot, which is due to radiation from deposits in this bone, producing pain and giving definite roentgenographic evidence of the lesion. Two other girls have the same osteitis localized in the scaphoid bone. Two others have similar radiation osteitis in the head of the femur, producing a coxa vara with marked shortening. One girl has had a spontaneous fracture through the upper third of the femur producing extensive crippling. At the present time she has a moderately severe anemia. When the litigation started, I told the lawyers plainly that I would not be used as an expert and would appear in court only on subpena as a county official. I also told them I would no longer take part in the medical examinations of living persons, but that if any died under my jurisdiction I would be bound to investigate the cause of death. The medical care of these girls was then taken over by Drs. St. George and Humphries, Gettler being asked to do the chemophysical work with Mrs. Hughes, a physicist. Dr. Charles

25. A New Jersey statute of limitations says that suit for damages must be brought within two years after inception of the disease. If this law was pleaded and upheld these girls would not have been entitled to bring suit, as most of them did not develop symptoms or realize that they were suffering from this disease until five, six and eight years after its inception.

26. Literally, the Court of King's Conscience dating from the early eighteenth century. Chancery had jurisdiction when there were no forms of action by which relief could be obtained at law, in respect of rights that ought to be enforced. Said King James, speaking in the Star Chamber: "Where the rigor of the law in many cases will undo a subject, then the chancery tempers the law with equity, and so mixes mercy with justice, as it preserves a man from destruction."

27. De Laet, Maurice: La pathologie professionelle due aux corps radioactifs, Ann. de méd. légale, October, 1928, pp. 442-452.

Norris rendered valuable aid as a consultant. Such a state of affairs existed until the settlement was made. The future medical care of these girls is under an apponted committee (Drs. Craver, Krumbhaar and Ewing), no member of which has had any previous connection with them. I have been present, however, at several examinations of these girls since the litigation started but have not taken an active part.

The clinical picture in these five girls is a little different from that in the early fatal cases. None have developed so far the profound anemias seen in the early cases. All but one have recovered from, or have never had, the necrosis of the mandible and maxillae that was such a prominent feature of the early cases. They seem to be suffering chiefly from the effects of radiation osteitis, more or less localized in such bones as are subject to external trauma or pressure, such as the scaphoid bones of the feet or the bones that bear considerable weight, such as the lower dorsal and lumbar spines, the heads of the femurs, the humerus and the glenoid cavities. The effect has been to produce chronic bone lesions, with pain, limitation of motion and a consequent crippling effect. Two of the girls cannot walk and practically have to be carried.

To what, then, is this different clinical picture due? The most feasible explanation would seem to be that a sufficient length of time has elapsed to allow the mesothorium, which forms the largest part of the deposits, to decay in its own natural, uninfluenceable manner, and that these girls may escape the fatal anemias and sepsis seen in the earlier cases.

Before the final hearing in chancery, I had the opportunity of witnessing an examination of these patients by the company's experts, in the presence of experts representing the plaintiffs. At this examination the only test made to determine whether the girls were radioactive was to have them sit in front of a gamma electrometer. The instrument used was said to be unaffected by atmospheric changes. This electrometer was supposed to detect penetrative rays coming from a living body thought to contain deposits of radioactive substances, chiefly in the bones. The total amount distributed throughout the skeleton was probably below 10 micrograms, and 95 per cent of the radiation coming from these deposits was alpha. In addition, important parts of the body, such as the tibia and femurs, which would contain a large amount of the radioactive substances, were from 2 to 3½ feet away from the instrument, allowing what little gamma rays were given off to be almost entirely absorbed by the body flesh. The readings were made by Schlundt and Flinn for the company, and separate readings were made by Mrs. Hughes and Gettler for the girls. I was informed that as a result of these tests the company's experts concluded that the girls were not radioactive, although Gettler told me that his readings in one case strongly suggested the presence of penetrative gamma rays. It is worth noting that, after the girls had been tested, one of the experts seated himself in the same chair in front of the instrument with 10 micrograms of radium element, or its equivalent, 5 micrograms in each of two vest pockets, and that the readings were no greater than those found in one of the girls. No test of the expiratory air, as outlined in our original article,[1] was made for the presence of emanation. We also had attempted to demonstrate radioactive deposits by means of penetrative gamma radiation in a manner similar to the test employed but had given this method up as entirely unsuitable for reasons that will be given in detail.

Shortly after this examination, at the suggestion of von Sochocky, Mrs. Hughes prepared screens of pure phosphorescent zinc sulphide uncontaminated by radioactive substances. After these had been examined in the dark room for scintillations, with negative results, each girl blew her expired air over these screens beneath the microscope. Scintillation from the presence of alpha particles in the girls' expired air was easily demonstrated in all five cases, proving beyond a doubt that they had deposits of radioactive substances in their bodies, which were giving off emanation.

AUTHOR'S INTERPRETATION OF THE DISEASE

On the basis of the studies made by me and my associates, I am of the opinion that the anemias, jaw necroses and various forms of crippling bone lesions encountered in these girls were due to the ingestion of insoluble sulphates of radium, mesothorium and radiothorium which occurred when they were employed as dial painters and which were due to their habit of pointing the brushes in their mouths. Most of the paint swallowed passed through the gastro-intestinal tract, but there was always a small amount that was absorbed day after day, month after month and year after year, as they worked. This was eventually deposited as insoluble sulphates of colloidal or particulate size in the phagocytic cells of the sinusoids of the reticulo-endothelial system, and especially in the bones, liver and spleen, with by far the greater amount in the bones.

In none of my patients that died, with the exception of the physicist, were there any appreciable radioactive deposits in the lungs. In this patient the type of exposure was different from that in the girls, consisting chiefly of the inhalation of emanation and radioactive dust and of penetrative external radiation. This observation is against the supposition of Castle and the Drinkers, who thought that the chief mode of entrance in these cases was by inhalation, and supports the original theory of Hoffman that the main danger lay in the licking of the brushes, with the consequent ingestion of the paint.

General Symptomatology.—A sufficient time has now elapsed to permit the clinical recognition of two types of cases: the early fatal ones and those in which death has not occurred.

In the early fatal cases in which there have been at least fifteen known deaths, all the patients suffered from a severe leukopenic anemia, and severe necroses of the mandible or maxillae or both, with buccal lesions and often terminal sepsis. Symptoms were first noted in these cases in from one to seven years after the patients ceased working as dial painters.

The later group, in which the five living girls cited belong, and in which there is evidence that perhaps other girls are similarly affected, presents a somewhat different clinical picture. In these cases the necroses of the mandible and the maxillae are not a prominent feature, nor is the severe anemia. It is quite possible that some of the patients may yet develop symptoms similar to those seen in the early cases, but in them the disease seems to follow a more chronic and slower course, characterized chiefly by low-grade crippling lesions of the bones due to a radiation osteitis set up by the deposits in the individual bones. With this classification in mind I shall discuss the special symptomatology of the disease more in detail.

(To be continued)

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET ⁞ ⁞ ⁞ CHICAGO, ILL.

Cable Address ⁞ ⁞ ⁞ ⁞ "Medic, Chicago"

Subscription price ⁞ ⁞ ⁞ ⁞ ⁞ ⁞ Five dollars per annum in advance

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SATURDAY, FEBRUARY 9, 1929

THE PROTEIN QUESTION

Ever since the classic studies of Chittenden and his co-workers at Yale University a quarter of a century ago, the problem of the proper quota of protein in the diet of man has agitated those persons who are concerned with practical nutrition. The actual experiments of the New Haven group tended to demonstrate that a marked reduction in the allowance of protein then current in the daily regimen could be tolerated without signs of what the clinician might term malnutrition and without indications of any decrease in well being. There were intimations, further, that the low-protein regimen ought to be actually advantageous to the individual. The reasons advanced are not cogent in the light of present-day information. They involved the idea of "sparing" certain organs, notably the liver and kidneys, from the physiologic work entailed in the catabolism of the unnecessary nitrogenous intake and the elimination of the consequent waste products. Just how real such an eventuality is in the economy of the body has never been clearly indicated. The thesis of "sparing" important organs, including the pancreas and other digestive structures, has often been advanced only to be met by the counterargument that, in some instances at least, "work" as expressed in vigorous function is an advantage rather than otherwise. Our muscles tend to improve with use and to atrophy with disuse.

A recent reviewer[1] has ventured the criticism that, in the experiments of Chittenden, the absence of control groups of subjects maintained on the usual protein intake but otherwise subjected to the same routine of life as the other groups must be keenly felt by the critical appraiser of their significance and renders questionable the deduction that the observed benefits of the experimental conditions imposed were due solely, if at all, to the reduction in protein intake. There are communities and races of men that have subsisted for generations on small amounts of protein comparable to those advocated by Chittenden and Hindhede, but their physical, intellectual and industrial characteristics are not such as to inspire confidence in the wisdom of their habits or any desire to follow in their footsteps. Among such communities, the reviewer continues, the low-protein diets in vogue are a matter not of choice but of necessity resulting from a food supply restricted by climate, geographic location or industrial backwardness.

Much of the experimental effort of former years to secure evidence of harm to the kidneys on a particular regimen was thwarted by ignorance of some of the fundamentals of diet. The rôle of the vitamins has been appreciated clearly only during the last fifteen years or less; likewise the dominating part often played by the lack of adequate, though often minute, quantities of some of the inorganic elements. Consequently, convincing research involving the long periods of observation that deterioration of bodily organs may call for was not always properly planned. Failures were often due to lack of some essential in the experimental ration rather than to an excess of some familiar food ingredient. However, the recent advances in the physiology of nutrition have made convincing research more possible and have enheartened investigators throughout the civilized world. Among the problems arising from recent studies is the question whether, after all, dietary protein may not be a factor in the genesis of human chronic nephritis;[2] whether there has not been undue parsimony at times in the feeding of persons suffering from nephrosis characterized by a lowered blood content of circulating protein; whether the protective value of renal hypertrophy under some dietary conditions has been adequately appreciated. The biochemists have forced on us the necessity, furthermore, of taking into consideration the "quality" as well as the quantity of the proteins ingested. Finally, the long debated question of intestinal putrefaction with its reference to undesired alimentary bacterial changes in proteins and the consequent possibilities of absorption of toxic rather than properly nutritive protein disintegration fragments has become involved by the circumstance that it is possible to alter the intestinal flora. The control of intestinal putrefaction is no longer attempted solely by reduction of protein, the pabulum of the putrefactive microorganisms, in the diet. A more effective and practical way consists in regulating the carbohydrate intake, including such foods as dextrin and lactose, which will persist in appreciable amounts for some time in the alimentary tract before absorption and thus favor the dominance of an acidophilic bacterial flora. In some cases, actual implantation of cultures appears to be an additional successful aid.

In the midst of these manifold uncertainties it is refreshing to find a well considered judgment that has

1. Mitchell, H. H.: The Physiological Effects of Protein, Editorial Review, J. Nutrition **1**: 271 (Jan.) 1929.

2. The Genesis of Chronic Interstitial Nephritis, editorial, J. A. M. A. **92**: 232 (Jan. 19) 1929.

weighed the current doubts against the more dependable accumulated facts. Mitchell of the University of Illinois at Urbana, who has recently summarized the information respecting protein problems, has come to a satisfying conclusion. It appears, he writes, that, with proteins as with other nutrients, successful nutrition and continued health and physiologic efficiency are possible over a wide range of intake, though environmental and activity factors may contribute to the existence of certain optimal intakes for certain conditions of living, but that with proteins, as with no other nutrients, the body is on continual guard against the potentially deleterious action of its intermediate digestion products, bacterial end-products, and intermediate metabolites. In this well phrased statement nothing is included about extremes of custom or practice. It scarcely requires more than empiric experience to teach the unwisdom of such aberrations of diet as unmistakably represent far too much or far too little of any food. Even that sovereign food, milk, has its dietary limitations.

RADIO BROADCASTING OF MEDICAL ADVERTISING

For some time it has been apparent that broadcasting on the radio, particularly of advertising matter, is in need of some sort of control or regulation. In November, 1927, THE JOURNAL first called attention to this subject in an editorial entitled "Broadcasting Buncombe." At that time the names of a dozen products whose claims were broadcast from several stations were mentioned explicitly as being beyond the realm of decency in advertising. It was suggested that the radio industry might well clean itself from within rather than wait for government compulsion to force it into honesty. With the passage of time the movement toward cleanliness has begun; many of the nostrums and frauds continue to be the subject of radio promotion, but the end is in sight.

Within the radio profession the National Association of Radio Broadcasters is working on some principles of ethics. The Better Business Bureaus of the nation are urging the adoption of radio advertising standards at least as high as those which govern newspapers in their acceptance of advertisements. In Chicago a plan is being developed whereby the Better Business Bureau will receive from each radio station a list of products being promoted through broadcasting and will supply each station with information relative to the basis for the claims that are made. Several fundamental resolutions have been offered for consideration, including the following:

> This radio station agrees that patent medicines or products of any kind, the use of which without the advice of a competent physician may prove dangerous to the health or physical condition of a user, shall be permitted time on the air only when competent medical authorities have approved them.
>
> So far as it is within its ability so to do, this station will see that all material used by representatives of the commercial institutions who have engaged the services of this station shall be accurate, truthful and not at variance with the ordinary tenets of good business and fair play.

In brief, the following code is suggested to govern radio advertising:

1. All advertising should clearly and plainly be presented as such.
2. Any and all statements shall be accurate, honest and not capable of misleading or deceiving listeners.
3. No statements derogatory to other forms of advertising shall be used.
4. No statements which refer to competitive products or reflect discredit on other merchandise or business houses shall be used.
5. Statements of a superlative nature which are insusceptible of proof, are unbelievable or invite retaliatory statements shall not be used.
6. Any product or service, the sale of which is contrary to interstate laws, shall not be allowed to use time over the air.

There is, moreover, another side of the subject to be considered. Radio material differs from news-print in the fact that it comes directly into the home and is listened to by the family circle. There is not the opportunity for censorship by the head of the family that prevails over reading matter. Radio lectures, therefore, as well as advertising must be given special consideration from the standpoint of decency, honesty and good taste. For this reason the conference held in Chicago by representatives of the broadcasting stations, the Better Business Bureau and the American Medical Association have offered the following resolution:

> Station directors should keep alive to the fact that all broadcasting is listened to by all members of the family circle and that nothing should be broadcast that is in poor taste, embarrassing, or offensive when heard by all members of the family.

In its current issue the *Editor and Publisher,* organ of the newspaper profession, points out that several editorial associations have already adopted resolutions demanding that radio advertising be placed on the same basis as newspaper announcements. It calls on newspaper men to aid in the defense of the public against the type of exploitation to which the radio succumbed. The harm done by radio advertising is more serious than anything possible through newspaper advertising. The fact that radio broadcasting is controlled by a federal commission lends credence to the statements that come over the air. The persuasiveness of the human voice and the direct personal appeal are likely to sway the mind of the listener more than does a printed statement. The promoters who travel the borderland between honesty and quackery, raking in the shekels of the unwary, have found in radio broadcasting a glorious accessory for their manipulations. The mutterings of mystics from India and of fortune tellers from France, the claims for hair growers from Austria, for magic horse collars, for radium drinking waters, for antiseptics, cosmetics, influenza and cancer cures, the sexual appeals of rejuvenationists, the mouthings of evangelistic and faith healers, and preposterous dietary schemes come pouring from the loud speakers like noisome effluvia from the great sewer that drains away the by-products of human physiology

in a metropolis. The combined action of the radio broadcasting industry and of the Better Business Bureaus of the nation should lead promptly to control, indeed, to actual sanitation, of this situation.

AN ANESTHETIC ACCIDENT

Accidents, avoidable or not, constantly occur and the daily papers record the serious consequences in property damage and in loss of human life. A crane may collapse because of defects in its manufacture; a large gas reservoir may blow up a neighborhood and destroy human lives; trains collide, maiming and killing scores of citizens each year. In fact, experts calmly predict the number of lives that will be lost in the coming year for any given city from automobile accidents, and the public accepts the prediction with serene resignation. When, however, a fatality occurs in a hospital as a result of the explosion of an inflammable gas, the news is broadcast throughout the country as a sensation. Those frantically inclined, without examining the circumstances, immediately condemn the anesthetic, hospitals in general and surgery in particular, paying little or no attention to the securing of facts.

Recently at Evansville, Ind., a tank containing nitrous oxide exploded, killing an anesthetist, maiming his attendant, and wrecking several rooms by the violence of the explosion. There was no tank containing ethylene in the room. The physician who was killed had the nitrous oxide tank on the floor, disconnected from the machine and was apparently manipulating the valve of the tank when the serious explosion occurred. Since there is no evidence that nitrous oxide explodes, it has been *assumed* that the nitrous oxide tank contained some ethylene. This presumably gained access to the nitrous oxide cylinder when, at some previous time, the tank had been suspended from the yoke of an old time anesthetic machine, so constructed that a mixture of the two gases would occur if the valves should be left open. On this assumption some ethylene passed into the nitrous oxide cylinder, producing an unknown mixture of a highly explosive nature.

Shortly after ethylene-oxygen anesthesia was introduced, distributers of the anesthetic gases recognized the inherent danger of mixtures of this gas with others and warned anesthetists about the danger. Accordingly, inexpensive devices were manufactured which, when attached to the old type apparatus, made it impossible to effect this dangerous mixture of gases. The type of machine standing in the operating room when the recent explosion occurred was not equipped with this device. Nitrous oxide is a highly unstable compound which supports combustion. Probably the nitrous oxide tank in question contained a mixture of nitrous oxide and ethylene. A static spark, discharged at the opening of the tank, would suffice to ignite the deadly mixture. The ignition traveled into the tank, the valve being open, and the deadly explosion resulted. Without a source of oxygen in the nitrous oxide tank which also supposedly contained ethylene, an explosion would not have occurred; alone, neither nitrous oxide nor ethylene is explosive. The accident occurred probably as a result of a mixture in the tank of these two gases, notwithstanding the ample warning given years ago.

Perhaps a hundred ether accidents occur annually. In six years since its introduction, twelve accidents have been recorded in which ethylene was the offending agent. Only three of these twelve accidents proved fatal. In two of the fatal cases, carelessness in the observance of the instructions was responsible. In the third fatal case, no effort was made to ground the apparatus, the patient and the anesthetist while the ethylene was being used. The sad fact in relation to ether explosions, nitrous oxide-oxygen-ether explosions, and ethylene-oxygen explosions is that no one capable of studying the problem has issued an adequate report on the basis of which the apparatus and procedure in the operating room might be so standardized *in principle* that all these explosions would be prevented. Ether anesthesia is too well established to be affected by explosions, which are usually not even reported.

When ether-oxygen anesthesia is administered through any of the anesthetic machines, or when nitrous oxide-oxygen-ether anesthesia is similarly administered, the dangers of fatal and disastrous explosions are also imminent. At present only the ethylene accidents and deaths are regularly reported. Is it not high time that a study in the prevention of all types of explosions be made, so that the advantages of anesthesia may be fully preserved for suffering humanity and the preventable explosions absolutely controlled?

Current Comment

TULAREMIA IN SHEEP

Several months ago,[1] attention was called to the wide range of animal life that is subject to infection with *Bacterium tularense*. In view of previous knowledge and the frequency with which domesticated animals are infested with ticks, it is scarcely surprising to learn that sheep have been found dead or sick with *Bacterium tularense* in their lymphatic glands.[2] The discovery, however, is not one to be treated too lightly. The risk man incurs in skinning or dressing the flesh of infected rabbits is now well understood. May there develop a comparable risk to butchers and even to housewives who handle the flesh of sheep? And if sheep may be infected, why not cows and pigs? Is the day coming when all meat must be handled with gloves? The answers to these questions must depend largely on whether tularemia is considered as a new disease or as

1. Tularemia in Birds, Current Comment, J. A. M. A. **90**: 1715 (May 26) 1928.
2. Parker, R. R., and Dade, J. S.: Tularemia in Sheep in Nature, Pub. Health Rep. **44**: 126 (Jan. 18) 1929.

an old disease newly discovered. It is easy to find objections to either hypothesis. If the disease is old, it is remarkable that it has not been long ago described, for some cases are of a virulent type and the syndrome is not less characteristic than that of many other diseases. It is remarkable, too, that so virulent an infection with so numerous a host of vectors should not have left in former years a plain impression as an animal plague. On the other hand, if the disease is new, how has it arisen? Here are problems for the investigator!

EXPERIMENTAL TETANUS

Spores of tetanus may develop in the human body but only in injured or debilitated tissue, unless in extraordinary numbers. Heretofore, in experimental work large numbers, even hundreds of millions, of detoxified spores have been injected, probably because it was found that symptoms were more easily produced. In any event such procedures, which do not simulate human tetanus, would appear to be valueless in the study of prophylaxis with antiserum on account of the enormous amount of toxin produced. Recently, evidence has been produced whereby it was determined that symptoms or death may result in guinea-pigs when an exceedingly small number of spores are used. This type of experiment would simulate, to a great extent, the conditions found in nature. It will be recalled that Francis [1] and also Armstrong [2] used a comparatively large number of tetanus spores in testing the infectivity on animals of artificially contaminated vaccine virus. Coleman,[3] however, reports the causation of fatal infection with less than ten spores. Likewise, this author noted that some of his experimental animals died without symptoms of tetanus, though often serous fluid from the wound and the scrapings of it caused tetanus in mice. When the same number of spores were used and small amounts of antiserum injected, death from tetanus, which was delayed, was always preceded by symptoms. In his experimental work Coleman used such accessory vehicles as rattlesnake venom and living staphylococci, and the guinea-pigs survived even when 500 spores were given. With a standard method for the preparation of spores there were used many other accessory infectivity factors. Saponin offered good results as a tissue debilitant and accessory infective agent, but the best results were obtained with liquor formaldehydi when comparatively small numbers, even as few as five spores, were injected. Likewise, there appears to be a difference of infectivity with various strains. In fact, Coleman asserts that a strain of type I infects only with thousands of spores. Surgical practice during the World War proved that the débridement of devitalized tissue was a most necessary adjunct in the prevention of tetanus. Probably human tetanus is initially produced by a few spores developing in a nidus of tissue contaminated by pyogenic or proteolytic organisms. Formaldehyde, by its inflammatory and necrosing action, appears to simulate this condition, which undoubtedly makes for reduced oxygen tension. Therefore this substance is apparently a precious means for initiating tetanus infection with a few spores and for the study of serum prophylaxis. Future experimental work with a minimal number of spores and perhaps with serums containing not only antitoxin but antibacterial bodies as well should yield additional information.

1. Francis, Edward: Bull. 95, Hyg. Lab., U. S. P. H. S., 1914.
2. Armstrong: Pub. Health Rep. 42: 3061.
3. Coleman: Am. J .Hyg., January, 1929.

Association News

THE PORTLAND SESSION

Special Exhibit on Morbid Anatomy in the Scientific Exhibit

Announcement is made of the appointment of the Committee for the Exhibit on Fresh Pathology for the 1929 session of the American Medical Association. The committee consists of Dr. H. H. Foskett, resident pathologist at the Emanuel Hospital; Dr. W. C. Hunter, resident pathologist at St. Vincent Hospital; Dr. Charles Manlove, resident pathologist at Good Samaritan Hospital, and Dr. Frank R. Menne, professor of pathology at the University of Oregon Medical School, as chairman.

The committee has organized and evolved a plan of securing both surgical and necropsy material. The members of the committee representing the different hospitals have generously placed at the disposal of the committee anything that may be of interest at the respective institutions. The particulars of demonstrations, discussions and exhibitions will be published in the Portland Number of THE JOURNAL.

MEDICAL BROADCAST FOR THE WEEK

The American Medical Association Morning Health Talks and Evening Health Hints from Hygeia

The American Medical Association broadcasts daily at 10 o'clock in the morning, central standard time, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of February 11 to 16 will be as follows:

February 11. "The Medical Value of Work," by Mr. H. J. Holmquest.
February 12. "Lord Lister and Modern Surgery," by Dr. James Nall.
February 13. "Mr. Dooley on Health," by Dr. R. G. Leland.
February 14. "A Change of Climate," by Dr. R. G. Leland.
February 15. "Unkinking the Mind," by Dr. R. G. Leland.
February 16. "The Training of a Physician," by Dr. N. P. Colwell.

Evening Health Hints from Hygeia at 8 o'Clock, Central Standard Time

February 11. Disinfection After Tuberculosis.
February 12. Danger Keys Up Our Behavior.
February 13. Runabout Child Needs Nap.
February 14. When Mother Love is a Stumbling Block.
February 15. Cosmetics.
February 16. Food Rules for School Children.

Banting's First Interview with Macleod.—To go back to the beginning, in July, 1920, after spending four years of postgraduate work in surgery at military and civilian hospitals, I commenced the practice of medicine in London, Ont. After observing the conventional office hours of 2 to 4 p. m. and 6 to 8 p. m. for twenty-eight consecutive days, my first patient presented himself. At the end of the month I had four dollars on the books. The succeeding months were not much more gratifying. However, in October, when the medical school opened, I was successful in obtaining an appointment as demonstrator in the department of physiology and anatomy which gave me access to these laboratories. . . . I shall never forget that first interview with Professor Macleod. Evidently my case was poorly presented, because at the end of the interview the professor asked me what I hoped to accomplish when the best trained physiologists had not succeeded in establishing or proving that there was an internal secretion of the pancreas. My request was that I should be given ten dogs, an assistant for eight weeks, and facilities for doing blood and urine sugar estimation.—Banting, F. G.: Cameron Price Lecture before the University of Edinburgh, Oct. 30, 1928, *Edinburgh M. J.* January, 1929.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

Bills Introduced.—Senate bill 8 creates a board of orthodontia examiners to consist of the board of dental examiners and two practicing orthodontists. Senate bill 22 regulates the distribution and sale of caustic or corrosive acids and alkalis. House bill 18 provides for the appointment of a registered pharmacist at the state asylum for the insane at Phoenix. House bill 24 amends the pharmacy act by requiring that an assistant pharmacist be at least 18 years old and have had not less than two years' experience in a pharmacy, under a registered pharmacist.

ARKANSAS

Bills Introduced.——House bill 124 creates a state board of health of nine who appoint from their number a state health officer to be approved by the government. Senate bill 55 would require all applicants for a license to practice any branch of the healing art to be examined in the basic sciences, as a prerequisite to examination by respective professional boards. This bill creates a board of examiners in the basic sciences, which are defined to be anatomy, physiology, chemistry, bacteriology and pathology.

CALIFORNIA

Bills Introduced.—Senate bill 105 authorizes the board of pharmacy to issue a permit to general dealers in rural communities where there is no registered pharmacist to sell simple household remedies and drugs. Senate bill 132 requires every person in charge of a hospital or ward thereof or pharmacy to report to the chief of police any case of personal injury coming under his charge. Senate bill 143 provides for the examination by the state board of health of persons other than registered nurses engaged in the practice of nursing for compensation. Senate bill 207 provides that when a defendant pleads not guilty by reason of insanity the court must select two and may select three alienists from the medical staff of the state hospitals. Senate bill 213 provides that any surgeon of the United States Army or Navy, honorably discharged or temporarily detached from service, may practice medicine in the state of California. Senate bill 231 creates a board of embalmers to license embalmers and funeral directors and to regulate the transportation of and traffic in dead bodies. Senate bill 258 creates a state board of cosmetology to license cosmetologists, hairdressers and cosmeticians. Senate bill 261 regulates dairy production and distribution. House bill 167 requires the director of institutions to create an institutional unit to be used for the custodial care of defective delinquents. House bill 171 provides that whenever the state board of health deems a body required to be buried at public expense unsuitable or unnecessary for scientific purposes, said body may be cremated or buried at public expense. House bill 177 gives the state board of health the power to seek out needy physically defective or handicapped persons under 18 and to furnish such services as are necessary. House bill 244 makes it the duty of the health officer of any city or county to report violations of the act providing for suitable sanitary conditions in foundries and metal shops. House bill 249 requires the state board of health to seek out needy physically defective or handicapped persons under 18 years of age and to arrange for their treatment. House bill 309 creates the office of county board of mental health to consist of city and county health officers and two physicians to be appointed by the state director of institutions. House bill 346 requires all applicants for marriage licenses to present certificates from a physician certifying the absence of venereal diseases. House bill 384 revises the poison drug schedules. House bill 405 requires all drug stores to be registered with the state board of pharmacy and to pay a registration fee of $1. House bill 490 provides that all private institutions for the care and treatment of insane or other incompetent persons shall be licensed by the department of institutions. Senate bill 214 amends the medical practice act in regard to the form of applications for certificates. Senate bill 215 amends the medical practice act in regard to the courses of study required of applicants. Senate bill 216 amends the medical practice act in regard to penalties for violations. Senate bill 217 amends the present medical practice act relating to refusal to issue certificates, suspension and revocation of certificates. Senate bill 487 authorizes cities and counties to establish tuberculosis preventoriums. Senate bill 513 would give physicians and hospitals a lien against any judgment recovered by the patient in a personal injury action. This would not apply, however, to any judgment recovered under the workmen's compensation act. Senate bill 546 amends the poison act by providing that the following preparations shall not be included in the schedule of poison: pills or tablets of aloin, belladonna and strychnine, plasters composed of aconite or belladonna, or elixir of iron, quinine and strychnine or ethyl alcohol denatured. House bill 394 would amend the poison act so as to allow farmers to buy poison spray materials from seed dealers. House bill 528 requires all substitutes for milk to be labeled "imitation milk." House bill 666 would require all applicants for a license to practice any form of the healing art to be examined in the basic sciences as a prerequisite to examination by any professional board. This bill creates a board of examiners in the basic sciences and defines the basic sciences as anatomy, physiology, chemistry, pathology and hygiene. House bill 688 amends the medical practice act by providing that the board of medical examiners may accept in lieu of the required examination for a license a certificate of examination issued by the National Board of Medical Examiners of the United States. House bill 719 would give physicians, nurses and hospitals a lien for services rendered against any sum recovered by the patient, either by judgment or by compromise, in a personal injury case. This will not apply, however, to any recovery had by reason of the workmen's compensation act.

COLORADO

Bills Introduced.—House bill 4 creates a state board of beauty culture examiners and regulates the practice. House bill 19 creates a board of chiropractic examiners and regulates the practice of chiropractic. House bill 29 provides for the registration and payment of $2 annually by a licensed dentist. House bill 561 makes it unlawful to sell or give away intoxicating liquors for medicinal or sacramental purposes except in accordance with the eighteenth amendment and the Volstead Act. Senate bill 414 provides that if any injured employee so requests, the employer shall tender him one change of physicians and, in a serious case, the employee shall be entitled to the service of a consulting physician to be provided by the employer. House bill 561 prohibits the selling or giving away of intoxicating liquors for medicinal or sacramental purposes except in accordance with federal laws.

CONNECTICUT

Society News.—For two successive years there have not been any deaths from typhoid in New Haven. In twenty-one years the typhoid death rate in this city has dropped from 30 per hundred thousand of population to 0.

Dr. Osborne Dies.—Thomas Burr Osborne, Ph.D., New Haven, for more than forty-two years research chemist at the Connecticut Agricultural Experiment Station, died, January 29, aged 69. Dr. Osborne spent his life at New Haven, becoming internationally known for research on the chemistry of vegetable proteins. He was awarded a medal in Paris in 1900 and the John Scott Medal of Philadelphia in 1922, and the Thomas Burr Osborne Medal was established in his honor in 1926. He was associate editor of *The Journal of Biological Chemistry*, and a research associate of the Carnegie Institution and of Yale University. He was honored by scientific societies in various countries. His achievements and beauty of character will long survive him.

A Million for Endowment of Nursing School.—President Angell of Yale University announced, January 31, that the Rockefeller Foundation had made a gift of $1,000,000 to the Yale School of Nursing. "Coming as it does at the end of a five-year trial period," he said, "this gift is of great significance. It means that a novel experiment has proved a success, and an educational program for nurses, comparable to that offered in medicine, law and engineering, is placed on a stable and permanent basis." Among the features of the Yale School of Nursing are high admission requirements, a thorough study of fundamental as well as practical training, a substantial tuition fee which the student pays, and the furnishing of maintenance by the hospital during the period of service in the wards. The purpose of the Yale School, organized in 1923, was to offer better educational opportunities rather than to increase the number of graduate nurses. Two years of college work was required for admission and the course covered

twenty-eight months. Practical experience is gained in the wards of the New Haven Hospital. Bedside skill is considered highly important at the Yale School, but it is looked on simply as a means toward the more important end of handling the patient intelligently in accordance with his physical and mental condition. Although these plans are somewhat novel, the announcement says, they are a necessary and logical development of nursing education in this country. The Yale School of Nursing is organized as an independent school in the university, equal in standing with other professional schools. In spite of the tuition fee and high admission requirements there have been 116 students enrolled, more than half of whom have college degrees. Miss Annie W. Goodrich, formerly president of the American Nurses' Association, was selected to organize the new school.

DELAWARE

Bill Introduced.—Senate bill 36 would require instruction to be given to children in the public schools in physiology and hygiene, with special reference to the effects of alcoholic drinks.

Personal.—Dr. William P. Orr, Jr., Lewes, has been made president of the Delaware State Board of Health, and Dr. Arthur C. Jost, Dover, formerly provincial health officer of Nova Scotia, has been made executive secretary and registrar of vital statistics.——Dr. Joseph C. Bloodgood, Baltimore, will address the New Castle County Medical Society, University Club, Wilmington, February 19, on lesions of the oral cavity. Members of the Kent and Sussex county medical societies and the dental and pharmaceutic societies are invited.

Delaware State Medical Journal.—With January came the first number of a new series of the *Delaware State Medical Journal*. Its publication was discontinued in 1923, on merging with the *Pennsylvania Medical Journal* to form the *Atlantic Medical Journal*. The joint publication was recently discontinued, and each of the two states has resumed publication under its own name. The first number of the *Delaware State Medical Journal* is a credit to the state medical society and to its publishers, both in appearance and in reading material.

ILLINOIS

Bills Introduced.—Senate bill 25 provides for the segregation of mental defectives with criminal propensities. Senate bill 40 appropriates $75,000 for hospital facilities for ex-service men at Jacksonville. House bill 48 authorizes the county board of each county to establish county tuberculosis sanatoriums and to levy a tax not to exceed one and one-half mills on the dollar annually on all taxable property of such county.

Smallpox Foci.—During January, 548 cases of smallpox were reported in Illinois, representing the widest prevalence in that month since 1921, when 1,900 cases were reported. The foci are most numerous in the central part of the state, but there is no section entirely free. There was one case of malignant smallpox at Pana which ended fatally, January 23, but the disease now is generally mild. Vaccination in Illinois is voluntary when smallpox is not present, but when an epidemic threatens a community, courts have the right either to require vaccination or to establish a quarantine.

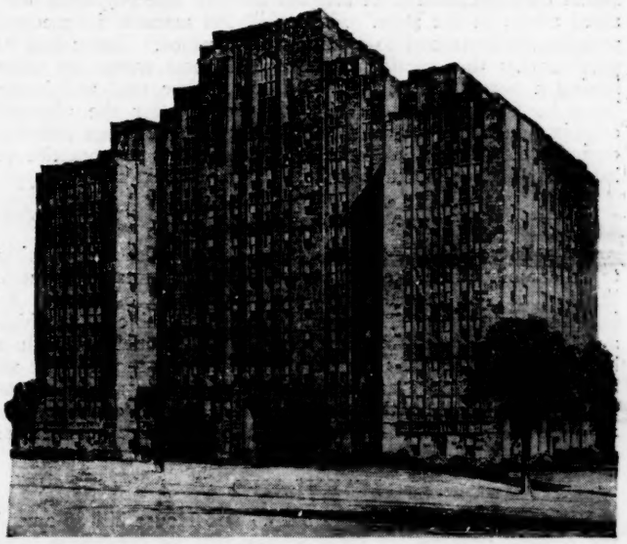
Chicago

Joint Meeting and Dinner to Dr. Wilbur.—The Chicago Medical Society and Sigma Xi, the honorary research fraternity, will meet jointly at the Medical and Dental Arts Club, February 20. Dr. Ray Lyman Wilbur, president of Stanford University, will give an address on "Significance of the Laboratory in the Progress of Civilization." Preceding the meeting, a dinner will be given at the club in honor of Dr. Wilbur. Invitations have been extended to the surgeon generals of the army, navy and public health service. Members of the Chicago Medical Society are cordially invited to the dinner and to the meeting.

Ochsner Memorial Lecture and Presidents' Dinner.—The third Ochsner Memorial Lecture will be given under the auspices of the North Side Branch of the Chicago Medical Society at the Germania Club, Clark Street and Germania Place, February 21, by Dr. George W. Crile, Cleveland, on "The Physical Nature of Death." Members of the Chicago Medical Society are invited. Preceding the lecture, a dinner will be given in honor of Drs. Malcolm L. Harris, President Elect of the American Medical Association, and Ex-Presidents Arthur Dean Bevan, William Allen Pusey and Frank Billings. President William S. Thayer, Baltimore, members of the Board of Trustees and other officers of the American Medical Association have accepted invitations. For reservations telephone Miss Wolff, 25 East Washington Street, Randolph 0244 ($2.50 per plate).

Society News.—At the annual meeting of the Chicago Heart Association at the Chicago Women's Club, February 18, Dr. Rufus B. Crain, medical director, Eastman Kodak Company, Rochester, N. Y., will speak on "Industrial Workshops and Their Importance in Relation to Placing the Handicapped." Dr. Walter W. Hamburger will preside at this meeting. Dinner reservations should be made not later than February 15; call Central 2288.——The Chicago Gynecological Society will be addressed, February 15, at the Murphy Memorial Building, 50 East Erie Street, by Dr. Joseph E. F. Laibe on common urologic lesions in gynecology, and by George W. Bartelmez, Ph.D., on "Some Factors in the Process of Menstruation."——The American Association of Immunologists will hold its annual meeting in Chicago, March 27-28, under the presidency of Dr. Karl Landsteiner of the Rockefeller Institute, New York.——The Chicago Medical Society held a public meeting on cancer, January 30, the speakers being Drs. David J. Davis, dean, University of Illinois College of Medicine, and Carl A. Hedblom, professor of surgery, University of Illinois College in Medicine.

Opening of Passavant Memorial Hospital.—The new 225 bed Passavant Memorial Hospital, erected on the McKinlock Campus opposite Northwestern University Medical School, will open about May 1. It is the first hospital to be constructed at the medical center on East Chicago Avenue, which is being developed with the medical school as a nucleus. One third of the beds in the Passavant Memorial will be available for university bedside instruction. Nine of the twelve stories will be for patients. The eleventh floor will be devoted to the operating department; the second floor to the laboratories and physical therapy department. For the present the east wing will be set aside for nurses' quarters and the nurses' school, which will be affiliated with Northwestern University. The superintendent of the hospital will be Dr. Irving S. Cutter, dean of the medical school. The Passavant Memorial Hospital was founded sixty years ago by Dr. W. A. Passavant, who also founded hospitals in Pittsburgh, Milwaukee and Jacksonville, Ill. The Chicago Passavant Hospital was formerly at 149 West Superior Street.



INDIANA

Bills Introduced.—House bill 362, reported under Indiana in THE JOURNAL last week, properly belonged under Colorado news. Senate bill 69 provides for the appointment by the governor of a board of trustees for the feebleminded, insane and epileptic colony at Butterville, the superintendent of this colony to be a reputable physician employed by the board of trustees.——House bill 51 provides that a county hospital may be established whenever 30 per cent of the residents present a petition to the board of commissioners to establish such hospital. House bill 92 broadens the power of the optometry board to prosecute the unlicensed prescription of lenses.

Society News.—The third clinic sponsored by Indiana University School of Medicine and the James Whitcomb Riley Memorial Association will be by Dr. Willis C. Campbell,

professor of orthopedic surgery, University of Tennessee College of Medicine, Memphis, February 12. Dr. Campbell will hold a diagnostic fracture clinic and give a public address on "Crippling Diseases of Joints in Children and Their Prevention," illustrated with motion pictures. His evening address will be before a joint meeting with the Indianapolis Medical Society. Dr. Howard B. Mettel addressed the Indianapolis Medical Society, February 5, on "Diabetes Insipidus in Children," and Dr. Gustavus B. Jackson on "Sterility in Women."

KANSAS

"Eye Specialists" Swindle Kansas Farmer.—Mr. R. W. Williams, a cattleman of Ellsworth County, was recently swindled out of about $6,000 by fake "eye specialists." According to the Hutchison *News*, the swindlers were traced as far as Kansas City, but there all trace of them was lost. The same two are said to have defrauded a farmer near Sylvia in Reno County. Mr. Williams lives alone in the thinly populated grazing section northeast of Ellsworth. Two men stopped at his door in a touring car last September, presumably to inquire their way, and while talking to Williams informed him that his sight was endangered by a cataract on his right eye. They were able to extract from him about $6,000.

Bills Introduced.—Senate bill 13 repeals the law relating to the distribution and sale of dangerous caustic or corrosive substances. Senate bill 17 creates a temporary commission to report on the condition of crippled children and physically disabled adults in the state. House bill 104 amends the medical practice act in regard to examination required. House bill 90 provides for the erection of sewage disposal works by cities having a population of 95,000 or over, to be paid and borne by a bond issue. House bill 160 provides for the physical examination of all persons handling foods and drugs entering commercial channels. House bill 173 regulates the practice of barbering and creates a board of barber examiners.

MAINE

Bills Introduced.—Senate bill 61 requires dental hygienists to be examined and licensed by the board of dental examiners. House bill 163 amends the law relating to osteopathy by including gynecology and surgery among the subjects in which an osteopath is examined. Senate bill 50 would establish a board of examiners for the basic sciences and require that all applicants to practice any branch of the healing art be examined and certified by the board of basic science examiners as a prerequisite to an examination by the respective professional boards.

MARYLAND

Bills Introduced.—Senate bill 45 and House bill 36 amend the medical practice act by providing that its provisions shall not apply to persons who practice the religious tenets of their church in the ministration to the sick by spiritual or mental means and without the use of any drugs or material remedies. Senate bill 44 prohibits vivisection on dogs.

Comparison of Influenza Epidemics.—More than 15,000 cases of influenza were reported in Maryland in the six weeks ending January 15, of which 9,400 cases occurred in the counties and about 6,000 in the city of Baltimore. In the less extensive outbreak in 1923, in Maryland, 18,451 cases were reported, of which 13,677 were in the counties and 4,774 in Baltimore. The most favorable recent years, as regards influenza, were 1924 and 1925, when there was a total of 2,156 and 2,125 cases, respectively; 3,771 cases were reported in 1928. The recent outbreak was not expected to reach its peak in Maryland for some time.

MASSACHUSETTS

Bills Introduced.—House bill 511 directs the governor to appoint a special commission of five to investigate the problem of industrial health. House bill 280 provides for the transfer of any patient admitted to the Pondville hospital, who has received the maximum amount of benefit available there, to any institution within the state. House bill 330 requires every hospital, clinic, dispensary, convalescent home or nursing home to obtain an annual license from the department of public health. House bill 368 provides that the school committee of a school district appoint one or more school physicians and nurses and one or more dental hygienists. House bill 426 directs the commissioner of public health to examine and analyze in his discretion samples of water in fresh water swimming and bathing places within the state. House bill 456 authorizes the city of Boston to erect a health department building within the limits of the Back Bay Fens.

Medical Expedition to Yucatan.—A party from the department of tropical medicine of Harvard University Medical School left New York, January 31, for Yucatan to make a medical survey of a section of that country about Chichen Itza, where there are pure blooded Maya Indians and villages of a mixed population. Since little is known of the diseases of these people, the survey may throw light on the causes of the collapse of the Mayan civilization following the Spanish conquest. The Carnegie Foundation of Washington will bear part of the expense; the headquarters of the expedition will be among the ruins of an ancient city where the foundation has maintained a station for archeologic research for years. The expedition is in charge of Dr. George C. Shattuck; other members are Joseph C. Bequaert, Ph.D., entomologist; Jack H. Sandground, Sc.D., parasitologist; Kenneth Goodner, bacteriologist, and Byron L. Bennett, laboratory technician.

MINNESOTA

Bill Introduced.—House bill 169 amends the workmen's compensation law by adding to the list of compensable occupational diseases contagious and infectious diseases contracted while caring for or handling any person having a contagious or infectious disease by a person regularly employed in contagious work.

Society News.—According to the *Journal-Lancet*, the offer of more than $1,000,000 by the Rockefeller Foundation to the medical school of the University of Minnesota has been withdrawn.——The Hennepin County Medical Society, Minneapolis, has taken a long term lease on the nineteenth floor of the Medical Arts Building at Ninth Street and Nicollet Avenue, which will be ready for occupancy about July 1. The auditorium here will seat about 600 persons.—Eli Lilly and Company, Indianapolis, has instituted at the University of Minnesota a fellowship to investigate the effects of ethylene in low concentrations in the air and in foods on animal metabolism.——The Hennepin County Medical Society, Minneapolis, was addressed, February 4, by John T. Tate, Ph.D., professor of physics, University of Minnesota, on "The Cosmic Rays" and by Dr. Charles A. Elliott, Chicago, on "Diagnosis of Pernicious Anemia as Modified by Experience Gained from Liver Feeding." The society is conducting a series of "colloquium lectures" as part of its regular program for the year. They include a noonday course in roentgen diagnosis by Dr. Leo G. Rigler of the University Hospital, and a course in pathology by Drs. William A. O'Brien, Elexius T. Bell and Benjamin J. Clauson of the University of Minnesota, beginning January 30. There is no fee or class organization, and each course will be given once a week for as many weeks as is necessary to cover the subject. These noonday lectures are held in the library rooms and involve no obligation of attendance except that which each member owes himself to take advantage of excellent opportunities.

MISSOURI

Rare Books Presented to Society.—Dr. James M. Ball, Jr., St. Louis, presented about 800 medical books to the St. Louis Medical Society at the annual meeting, January 8, including many texts printed in the fifteenth and sixteenth century and representing the history of medicine from the days of Vesalius up to the time when Dr. William Beaumont published his work on the physiology of digestion. The gift is one of the most extensive the library has received.

Bills Introduced.—House bill 27 directs the state university and each state teachers' college and all schools providing courses of college rank and receiving state funds to offer courses in preventive medicine and oral and dental hygiene. Senate bill 11 requires coroners, on notification of death, to report the death to the sheriff, who shall make out a warrant directed to the constable to summon a jury of six. Senate bill 55 provides that whenever in the trial of a criminal case the defense is insanity, the judge may call disinterested experts not exceeding three.

NEBRASKA

Bills Introduced.—House bill 148 creates a board of cosmetology examiners. House bill 252 would require every prescription for administration of drugs to be written solely in English and in triplicate. House bill 253 provides that all health boards, state, county, or municipal, shall consist of not more than two physicians, one regular practitioner and one drugless practitioner, one business man, and four sanitary engineers.

NEW HAMPSHIRE

Bills Introduced.—House joint resolution 59 appropriates $120,000 to the New Hampshire state sanatorium for a hospital building for the care of tuberculous children. House bill 260 repeals the compulsory vaccination law.

NEW JERSEY

Personal.—Dr. John Cassidy has joined the staff of the Mental Hygiene Clinics of Northern New Jersey, having completed a fellowship in psychiatry with the Commonwealth Fund. —— Dr. Herman Trossbach, Jr., Bogota, has been appointed director of the medical service at the Hackensack Hospital, Hackensack, to succeed Dr. Alvah A. Swayze, who resigned on account of ill health.

Bills Introduced.—House bill 54 provides for the sexual sterilization of insane, feebleminded and epileptic inmates of state institutions. Senate bill 11 authorizes any county or one or more municipalities of school districts to enter into a joint contract for public health service. Senate bill 17 amends the pharmacy law by requiring two years of study in a school of pharmacy. Senate bill 21 provides for the appointment of impartial expert witnesses by the court. House bill 25 provides that osteopaths, chiropractors and naturopaths are to be licensed by one board of examiners to be known as the state board of osteopathic, chiropractic and naturopathic examiners, and to consist of three osteopaths, three chiropractors and three naturopaths.

NEW YORK

Bills Introduced.—House bill 536 amends the workmen's compensation law by providing compensation for employees disabled because of silicosis. House bill 566 amends the health law by making it a felony to sell or distribute habit-forming drugs, and providing for imprisonment not to exceed ten years. Senate bill 179 and House bill 329 authorize the city of Olean to issue bonds to pay the expenses of a health officer and the claims for damages arising on account of the recent typhoid epidemic. Senate bill 204 and House bill 317 permit contracts for maintaining in a county hospital tuberculous patients from another county. Senate bill 261 provides that a hospital furnishing medical or other attention to a person accidentally injured shall have a lien for the amount of its charges on any insurance or other benefit which may be paid on account of the accident. House bill 309 amends the mental hygiene law in relation to Craig Colony by providing that any person with whom an alleged epileptic patient may reside may petition for the epileptic patient's commitment. House bill 327 amends the education law in regard to school hygiene districts by providing that funds may be appropriated for assistants to the director of school hygiene. House bill 338 provides for the sexual sterilization of insane, idiotic, imbecilic, epileptic and feebleminded inmates of institutions supported wholly or in part by public funds. House bill 364 and Senate bill 281 amend the education law relative to the practice of medicine by requiring a physician to certify that he has never solicited or advised patients while attending a hospital to retain an attorney to prosecute a claim for personal injury. House bill 389 amends section 13 of the workmen's compensation law by striking out the provision that a claim for medical treatment shall be void as against employer unless the physician within twenty days after the first treatment furnishes a report of the injury and treatment. House bill 392 amends subdivision 2, section 3, of the workmen's compensation law by adding to the list of occupational diseases compensable all disabling diseases and illnesses. House bill 435 would penalize the possession of narcotics by imprisonment for not less than five nor more than ten years. House bill 416 amends the general business law by providing that provisions therein for licensing employment agencies shall not apply to incorporated alumnae associations of registered nurses. House bill 459 amends the poor law by providing that a tuberculous poor person shall not be deemed settled in any town in Greene County until he has lived there five years. House bill 467 provides for a lien of hospitals for treatment in accident cases, this lien to attach to any insurance money, fund or benefit accruing to injured persons. House bill 487 amends the workmen's compensation law by adding to the list of occupational diseases any and all disabling diseases and disabling illnesses.

New York City

Personal.—The Edison medal, awarded to William D. Coolidge, Ph.D., for his contributions to the incandescent and electric lighting and roentgen-ray arts, will be presented, February 15, at the annual winter meeting of the American Institute of Electrical Engineers in the Engineering Auditorium. The ceremony will include, among others, an address by Michael I. Pupin, Ph.D., who will outline the achievements of Dr. Coolidge, and the response of the medalist.

City Death Rate Increased.—Health Commissioner Wynne announced, January 2, that New York City's death rate, during 1928, was 12.92 per thousand of population, as against an average of 12.22 for the last five years. In the announcement made during the meeting of the American Association for the Advancement of Science, Dr. Wynne pleaded for scientists to devote more effort to the prevention and cure of disease and for physicians and the public to cooperate in using more thoroughly the knowledge of disease and health that is now available. He said that cancer caused 7,677 deaths in New York last year; pneumonia, 9,951; heart disease, 17,079; chronic interstitial nephritis, 3,004; pulmonary tuberculosis, 4,611; influenza, 891, and meningitis, 514.

Society News.—The Associated Physicians of Long Island held their thirty-first annual meeting at the Brooklyn Hospital, January 26. At the evening session, Dr. John Foote, professor of pediatrics, Georgetown University School of Medicine, Washington, D. C., spoke on "Child Care in History and Art," illustrated with lantern slides.——At the stated meeting, February 7, of the New York Academy of Medicine, Dr. Leland S. McKittrick, Boston, presented a paper on "Surgical Treatment of Gangrene and Infection of the Feet in Diabetes," and Dr. Lincoln F. Sise, Boston, "Spinal Anesthesia in Abdominal Operations." The February 8 lecture, in the afternoon series, was by Dr. Hugh H. Young, Johns Hopkins Hospital, Baltimore, on "Diseases of the Prostate."

Gifts to Columbia University.—President Butler of Columbia University announced, January 16, the following gifts, among others, to the university: $175,000 from an anonymous donor toward building a dormitory for medical students; $50,000, anonymously, and $30,000 by Henry W. Gillett, D.D.S., to the school of dental and oral surgery; $10,000 from the General Education Board for the maintenance of the department of the practice of medicine for the year 1928-1929; $10,000, the income of which is to promote cancer research, from Mrs. Clarence Carpenter; $18,000 for the maintenance of a subdepartment of tropical medicine this year; $2,500 from the International Committee for the Study of Infantile Paralysis; about $1,800 from the Chemical Foundation, Inc., for construction changes in the department of biologic chemistry; $1,000 from the New York Milk Conference Board for research in the Delmar Institute of Public Health; $250 from Mr. A. Wineburgh for cancer research. The total gifts to the university announced at this time amounted to nearly $424,000.

NORTH CAROLINA

Bills Introduced.—Senate bill 37 and House bill 44, the budget revenue bill of 1929, provide that every practicing physician shall obtain from the commissioner of revenue a statewide license for the privilege of practicing medicine, on payment of a license fee of $25. Only one half this amount shall be collected from a physician whose net earnings the previous year did not exceed $1,000. Senate bill 73 provides for the asexualization of mental defective inmates of state charitable and penal institutions.

Appointment of Professor of Medicine at Duke University.—The dean of Duke University School of Medicine, Durham, announces that Dr. Harold L. Amoss has been appointed professor of medicine. Dr. Amoss, who will go to the university in 1930, is a native of Kentucky and a graduate of the University of Kentucky and of Harvard University Medical School. He also has a D.P.H. degree from Harvard. He was at the Rockefeller Institute, New York, for ten years and for the last seven years has been associate professor of medicine at Johns Hopkins University, Baltimore. He has published studies on poliomyelitis, erysipelas and other subjects.

Personal.—Dr. Henry F. Hunt has been granted a leave of absence from the Mayo Clinic, Rochester, Minn., to teach in the department of pathology at the University of North Carolina, Chapel Hill.——Dr. Fred M. Hanes, Winston-Salem, has been appointed by Governor McLean a member of the board of directors of the North Carolina Sanatorium.—— Dr. Grady A. Morgan was reelected, January 14, health officer of the county of Buncombe.——Drs. John T. Burrus, High Point, and John T. J. Battle, Greensboro, have been reelected members of the Guilford County Board of Health.—— Dr. Charles W. Armstrong has been reelected health officer of Rowan County.——The Sampson County Medical Society was addressed, Dec. 3, 1928, by Dr. James S. Brewer, Roseboro, on "Some Remarks on the Ethical and Economic Sides of Practice."——The governor has appointed Dr. Henry F. Long,

Statesville, a member of the state board of charities and welfare.——Dr. Murray P. Whichard has been appointed health officer of Chowan County with headquarters at Edenton.

NORTH DAKOTA

Bills Introduced.—Senate bill 71 amends the pharmacy license law by requiring at least two years' practical experience in a retail pharmacy. Senate bill 64 provides for the supervision of plumbing by the state department of health and creates a board of plumbing examiners.

OHIO

Bills Introduced.—House bill 47 provides for the state health department to make inquiry into the causes of blindness and to adopt preventive measures. Senate bill 48 amends the medical practice act by providing that it shall not apply to persons who practice only the religious tenets of their church without pretending to a knowledge of medicine and surgery.

Report on Library.—At the annual meeting, January 21, of the Cleveland Medical Library Association, reports showed that the land and buildings of the association are worth $800,000 and that the endowment funds amount to $290,000. The library, which has 38,500 bound volumes of books and journals, was visited last year by 8,400 readers. The annual meeting was addressed by Dr. Samuel W. Kelley on "Cleveland's Medical Authors." The election resulted in the choice of Dr. William T. Corlett as president, and Dr. Clyde L. Cummer, chairman of the board of trustees.

Society News.—Dr. Richard Dexter has been elected president of the Academy of Medicine of Cleveland for the ensuing year; Dr. Dexter is the newly appointed chief of staff of St. Alexis' Hospital, succeeding Dr. George E. Follansbee.——Dr. Clarence M. Valentine has been elected president for the ensuing year of the General Practitioners' Medical Society of Columbus.——Dr. Thomas H. Brown was installed as president of the Toledo Academy of Medicine, January 4, and Dr. Barney J. Hein was made president-elect.——Dr. Roger S. Morris addressed the Academy of Medicine of Cincinnati, recently, on "Mediastinal Pleurisy."——Dr. William D. Andrus, Cincinnati, addressed the Clermont County Medical Society, recently, on "The Acute Surgical Abdomen," and Dr. Stanley E. Dorst, Cincinnati, the Clark County Medical Society on "Bacterial Antigens."——The Montgomery County Medical Society, Dayton, was addressed, Dec. 7, 1928, by Dr. Samuel Iglauer, Cincinnati, on "X-Ray Diagnosis of Pulmonary Lesions by the Intrabronchial Injection of Opaque Oils."——The Sandusky County Medical Society was addressed, recently, by Dr. Charles W. Stone, Cleveland, on "Psychologic Healing in Antiquity."——Among others, Dr. John D. Dunham, Columbus, addressed the Columbiana County Medical Society, East Liverpool, Dec. 4, 1928, on "Methods and Evaluation of Physical Examination."——The annual D. Tod Gilliam Memorial Lecture was presented before the Columbus Academy of Medicine in November by Dr. Reuben Peterson, Ann Arbor, Mich., on "Present Status of Surgical Treatment of Retrodisplacement of the Uterus."——The University of Cincinnati College of Engineering and Commerce has completed arrangements for a new course in chemical technology for women students, the purpose of which is to train them as laboratory technicians for hospitals and laboratories; the course is continuous throughout the year and applicants may enter only at the beginning of the session in the fall. Further information will be given on request by the dean.——The Academy of Medicine of Cleveland was addressed, January 18, by Drs. Elliott C. Cutler on "Surgical Treatment of Varicose Veins," and Francis J. Doran on "Interesting Forms of Arterial Disease."

OKLAHOMA

Bills Introduced.—House bill 122 would repeal the workmen's compensation law. House bill 150 creates a board of chiropody examiners and regulates the practice of chiropody.

OREGON

Bill Introduced.—House bill 179 would require a coroner before performing an autopsy to obtain the consent of the relatives or an order from the circuit court.

Hearing on Child Health Demonstration.—Following the annual taxpayers' meeting at Salem, Dec. 28, 1928, at which friends and opponents of the Marion County Child Health Demonstration were heard, an increase in the county budget for the health unit from $1,870 to $6,050 was approved by the court on the condition that it shall have control over the manner in which the money is spent. The opposition to the appropriation, while largely from the farming communities, did not express itself as antagonistic to the principle of the demonstration. There appears to have been previous to this meeting some doubt as to whether the demonstration would continue after the first of the year in view of the increased appropriation proposed. The hearing was attended by about 100 persons, representing farmers, civic organizations and clubs. Opinion seemed to be generally favorable to the demonstration. The chief question apparently was an economic one.

PENNSYLVANIA

Society News.—The women's auxiliary of the Allegheny County Medical Society will give a "benefit bridge," February 11, at the William Penn Hotel, the proceeds to be devoted to a loan fund for medical students of the University of Pittsburgh.

Which Smoke Stack Is Used?—The group of buildings of the U. S. Bureau of Mines in Pittsburgh is surmounted by two smoke stacks, only one of which is used. The battery of furnaces burn soft coal, but by correct stoking it is consumed without smoke. The superintendent for ten years has challenged any passerby to tell which of the smoke stacks is in use. He will explain the method of firing with soft coal without smoke on request to any tenant, landlord or manufacturer.

Bills Introduced.—Senate bill 13 would change the personnel of the Osteopathic Surgeons' Examining Board by having it consist of five members and the superintendent of public instruction, one of the members to be a deputy or other employee of the department of public instruction, two to be appointed from persons nominated by the state board of medical education and licensure and two to be osteopathic surgeons. Senate bill 14 would require of every applicant to practice medicine a minimum of two completed years of college credits leading to a degree in arts and science and including not less than eight semester-hours each of chemistry, biology and physics and four semester-hours of organic chemistry. Senate bill 15 would require the state board of medical education and licensure to appoint a board of chiropractic examiners to consist of five chiropractors and the superintendent of public instruction. The board of medical education and licensure would also be required to appoint in a like manner examining boards for naturopaths, neuropaths and others except osteopaths desiring licensure in other branches of drugless therapy. The board of medical education and licensure would also provide for the preliminary examination of applicants for licensure as chiropractors or other drugless practitioners excepting osteopaths in the basic sciences which are defined to be anatomy, physiology, pathology, bacteriology, hygiene, biochemistry, symptomatology and diagnosis. Senate bill 12 and House bill 8 create a commission to codify the laws relating to the healing art. Senate bill 85 would amend the present medical practice act. House bill 7 provides that any resident, indigent, ex-service man shall be treated by any hospital receiving financial aid from the state, the expenses of such treatment to be borne by the state. House bill 21 creates a state board of examiners in cosmetology. House bill 219 provides for the asexualization of mental defectives so adjudged by a court of competent jurisdiction.

Philadelphia

Society News.—A moving picture on "Intestinal Peristalsis," made at the Mayo Clinic, was presented before the Philadelphia Medical League, January 28, by Dr. Joseph M. Fruchter.——The Philadelphia Academy of Surgery was addressed, February 4, by Drs. Leon Herman and Lloyd B. Greene on "New Growths of the Renal Pelvis."——Dr. John R. Page, New York, will address the Philadelphia Laryngological Society, March 5; the society was addressed, February 5, among others, by Dr. Arthur J. Wagers on "A Study of Tonsillectomitized Individuals."——The Nathan Lewis Hatfield lecture of the College of Physicians was delivered, February 6, by Dr. Simon Flexner on "Epidemic and Postvaccinal Forms of Encephalitis."——The Philadelphia Obstetrical Society was addressed, February 7, by Dr. Thomas H. Cherry on "Colored Moving Pictures as an Aid in Gynecologic Teaching."——Dr. Ralph S. Bromer read a paper on "Unilateral Heredity Deforming Dyschondroplasia (Ollier's Disease)" before the Philadelphia Roentgen-Ray Society, February 7, and Dr. Louis Edeiken on "Roentgen Appearance of Bone Changes in Scleroderma."——The Philadelphia Pediatric Society and the Kensington branch of the county medical society in joint session will be addressed, February 12, among others, by Drs. Vincent T. Curtin and Herman F. Kotzen on "An Unusual Case of Progeria," and by Dr. Joseph V. Klauder on "The Treatment of Birth Mark."——The next lecture under the auspices of the Biochemical Society of Jefferson Medical College will be

given in October by Howard B. Lewis, Ph.D., University of Michigan Medical School, Ann Arbor; this will be the first of this series to be given in the new laboratory building at the college now under construction.

TEXAS

Hospital News.—The auxiliaries of the Nacogdoches County Medical Society and the chamber of commerce sponsored the formal opening of the Nacogdoches Memorial Hospital, Dec. 11, 1928; about 650 persons attended. The $100,000 hospital was built with funds obtained from the sale of the Municipal Electric Light Plant and from donations. Mrs. E. A. Blount donated the site. The initial capacity will be forty beds.——The Loretto Hospital, under construction at Dalhart by the Sisters of the Holy Family of Nazareth, will be completed in April. It will have forty beds.——The $140,000 San Angelo Hospital was formally opened, recently; this hospital, made possible by the donations of 114 persons, was sponsored by the Concho Baptist Association.

Bills Introduced.—House bill 170 would require dental hygienists to be licensed by the state board of dental examiners. Senate bill 126 amends the act regulating the practice of medicine by requiring physicians to register annually and pay a registration fee of $2. House bill 171 provides that a licensed physician shall not disclose on the witness stand a communication made to him by a patient during the existence of that relationship nor disclose any other fact that came to his knowledge by reason of such relationship. House bill 271 would give licensed physicians a first and prior lien for medical services rendered to any persons on all crops of said persons, provided the bill for such services does not exceed $25. House bill 305 creates a board of examiners for hairdressing and cosmetology. Senate bill 314 establishes an institution for the treatment of persons suffering from cancer or pellagra. House bill 270 establishes a state tuberculosis and epilepsy sanatorium for negroes.

WASHINGTON

Personal.—Dr. Clyde W. Countryman has been appointed police surgeon at Spokane to succeed Dr. Herbert E. Wheeler, resigned.——Dr. William D. Kirkpatrick has been elected chief of staff of St. Luke's Hospital, Bellingham, succeeding Dr. Frank J. VanKirk, who has held that position for about seven years. ——About forty physicians attended the unveiling of a bronze plaque in the Columbus Hospital, Seattle, January 10, in honor of its former chief of staff, the late Dr. James H. Lyons.——Dr. Willis H. Corson has been appointed superintendent of the King County Hospital, Seattle.——Dr. Samuel G. Brooks retired, January 1, as mayor of Anacortes after six years' service.——Dr. John F. Steele, Tacoma, has resigned as medical director of the Mountain View Sanatorium, Lakeview, to engage in private practice.

Bills Introduced.—Senate bill 62 limits the use of x-rays to licensed physicians and x-ray technicians and declares that licenses to practice as an x-ray technician shall be issued by the director of licenses. Senate bill 87 creates a traffic accident fund for injuries sustained on public highways regardless of negligence and abolishes the common law remedies for such injuries, the fund to be raised by an additional tax on motor vehicle licenses. House bill 80 provides that neither school authorities nor employers may exclude any one because of nonvaccination and prohibits compulsory vaccination. House bill 93 prohibits hospitals from preventing a licensed physician of any school from using the hospital in any way. Senate bill 84 authorizes the director of business control to establish an institution in the western part of the state for the custody of mental defectives, this institution to be known as the Western Washington Industrial School.

WEST VIRGINIA

Bills Introduced.—Senate bill 31 provides for the asexualization of inmates of state institutions affected with any hereditary form of insanity or epilepsy. House bill 2 would except physicians from the prohibition against owners of motor cars from using sirens.

Medical Library Established.—The West Virginia State Medical Association moved its offices, January 17, into a three room suite in the public library building at Charleston, where a medical library will be established at once and operated by the association. About 100 volumes have been presented to form a nucleus for the library. This has created unusual interest, as it will be the first library of its kind in West Virginia.

WISCONSIN

Bills Introduced.—Senate bill 19 memoralizes the United States Congress to reenact the Sheppard-Towner Maternity and Infancy Act. House bill 40 provides that an institution which, by the provisions of the National Prohibition Act or its regulations, is not required to pay a tax on alcohol, shall not be required to pay a fee for a permit to obtain alcohol for medicinal or scientific uses.

GENERAL

Number of Examiners for Pensions Reduced.—Congress has passed a bill which provides that applicants for pensions before the bureau of pensions shall be examined by only one physician, who will receive a fee of $5. The policy for years has been to have applicants examined by a board of three physicians, each of whom received a fee of $3. The bureau of pensions believes that the change will result in more efficiency and be more beneficial to applicants, and at the same time will reduce the expenditure of the government by about $200,000.

Report of General Education Board.—The annual report of the General Education Board of the Rockefeller Foundation, New York, is in seven sections, one of which is on medical education. The board cooperated during the last year with a small number of universities, it is said, in developing high-grade medical departments in the hope of stimulating a broad upward movement. The board appropriated $60,000 to assist in developing a department of tropical medicine at Columbia University, to be paid on a decreasing scale over five years. Thirty thousand dollars is to be paid to the University of Pennsylvania medical department over a similar period to stimulate effective cooperation between the departments of pharmacology and general medicine; $15,000 was appropriated annually for three years for the purchase of books for the medical library of Vanderbilt University. The board appropriated $15,000 to Washington University in 1927 to assist in securing the service of a full-time professor of ophthalmology, and subsequently appropriated $680,000 to assist in organizing and conducting the ophthalmologic clinic on a university basis, and $10,000 a year for five years to enable the surgical department to retain for a prolonged period a number of men looking forward to university careers in surgery. The board appropriated $24,000 to Yale University, payable over a three year period, to assist in organizing a department of bacteriology of which Prof. F. D'Herelle is the head. An appropriation of $100,000 was made to the National Board of Medical Examiners to assist the board, during the next five years, in becoming self-supporting or to raise outside funds which will support it permanently. This gift was made on condition that the National Board of Medical Examiners raise a supplemental amount equal to the sum by which the General Education Board's appropriation is annually reduced. The funds of the General Education Board at their maximum reached a total book value of $130,000,000. Of this sum it was expected that $50,000,000 would be used to assist universities and colleges to raise endowments, the income from which would be applied to the increase of salaries. Of the salary fund of the board, more than $38,000,000 has been appropriated. It is estimated that through the expenditure of this fund, $122,499,080 has been added to the endowments of the 176 institutions to which appropriations from it had been made.

FOREIGN

Influenza in Europe.—The outbreak of influenza which recently swept across the United States has become epidemic in Europe and in other countries. According to the New York *Times*, many business offices in London were crippled by the absence of employees, while employees who worked outside were less affected. Germany, Hungary and Finland were among the chief sufferers in Europe; the city of Warsaw reported 100,000 cases, mostly mild. A dispatch from Suva, Fiji Island, stated that practically all of the inhabitants had been ill with influenza. Among those affected in Europe were the premier and the minister of finance of Spain.

Death of Professor Unna.—Paul Gerson Unna, honorary professor of dermatology at the University of Hamburg, Germany, died, January 29, aged 78. Professor Unna was recognized as an authority, especially on the histology of the skin. In 1887 he reported the disease which bears his name as "seborrheal eczema." Among other things he divided the stratum corneum into four layers, described the "balloon cells" of herpes zoster, and studied the bacteria associated with several skin diseases. He initiated the study of diseases of the skin by means of diascopy in 1883, and in 1894 published "Die Histopathologie der Hautkrankheiten." Since retirement from active practice he has been engaged in microscopic research.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 12, 1929.

Street Accidents

A booklet issued by the safety first association, analyzing the causes of street accidents in the last ten years and showing that the campaign conducted by the association is making people more careful, is recommended by the home secretary and the minister of transport as president and vice-president, respectively. "We have frequently stated," they write, "that the majority of street accidents are due to causes which can never be eliminated solely by legislative or engineering measures. A substantial diminution will in our opinion only follow on education in accident prevention of all road users, not only the mortorist, but also the cyclist and pedestrian; and, in particular, the younger generation. In adopting as their main activity the education of the public, the National Safety First Association is doing work of national value, and one which has already produced excellent results." The analysis shows that from 1918 to 1928 there were 1,000,000 street accidents involving death or personal injury. Nearly 40,000 of the accidents proved fatal. In 1927 more than 5,300 persons were killed and 148,500 were injured. At present one in every twenty motor vehicles is each year involved in an accident resulting in personal injury, and every year about 200,000 new motor vehicles are added to the total. The causes of accidents are shown to be road defects in 6 per cent of the cases; vehicular defects in 7 per cent; weather conditions in 4 per cent, and human failure on the part of pedestrians, cyclists and motorcyclists in 83 per cent. The special national campaign, started by the safety first association in 1925, is shown to have produced results. In 1919 the percentage increase in the number of street accidents was 36; in 1921 it was 10; in 1923, 1924 and 1925 it was 18, and in 1926 and 1927 it fell to 8. The reduction in the last two years meant the prevention of 25,000 street accidents.

London's Deadly Streets

During July, August and September, 1928, 309 people were killed in the streets of London—282 by motor vehicles and twenty-seven by horse-drawn conveyances and pedal cycles. Of these no fewer than eighty were killed through carelessly crossing the road, fifteen being children under the age of 15. Five children were killed while playing in the streets. Thirty-seven people were killed by omnibuses, eight by tramcars, ten by cabs, ninety by private motor cars, fifty-six by motor cycles, and eighty-one by trade and commercial vehicles. Two were killed by horse-drawn broughams, twelve by trade and commercial horse-drawn vehicles, and thirteen by pedal cycles. Accidents in which people were injured numbered 31,079, the motor vehicles concerned being omnibuses, 1,753; tramcars, 1,271; cabs, 1,126; private motor cars, 10,878; motor cycles, 4,706; trade and commercial motor vehicles, 6,048, and traction engines, eighteen. Four people were injured by horse-drawn cabs; twenty-six by broughams; 1,652 by horse-drawn trade and commercial vehicles; 3,572 by pedal cycles, and twenty-five by horses which were either driven or led. Six cyclists were killed through skidding on tram lines, and twenty-four people died as the result of collisions.

Pathologic Studies at the Zoological Gardens

Lieut. Col. A. E. Hamerton of the army medical corps has been appointed pathologist to the Zoological Society. He has had a wide experience with disease in many parts of the world. He was assistant director of pathology at the war office; as a member of the Sleeping Sickness Commission appointed by the Royal Society he worked in Uganda and Nyasaland with Sir David Bruce from 1908 to 1910, and he has served in Iraq and at Aden. In addition to reports on trypanosomiasis, he has published papers dealing with streptococcal infections and rabies. The primary function of the pathologic work at the zoo is to ascertain the cause of death of animals in the collection, so that advice for treatment and prevention may be given. The first business is to ascertain whether the death is due to any infectious or contagious disease, in which case immediate measures are taken for the disinfection of the house or compartment in which the animal died, and for the isolation of possible contacts. A staff of parasitologists, under the direction of Professor Leiper, collects and identifies the parasites found in the bodies of most animals, which are often the cause of sickness or even of death. Dr. Wenyon of the Wellcome Bureau of Scientific Research examines and reports on blood smears prepared by the pathologist from the dead animals while they are still fresh. Other deaths are due to tumors or new growths, defective nutrition, accidents or structural changes or abnormalities, and the investigation of these occupies much time. The pathologist also consults with the curators as to the preliminary symptoms of disease. The importance of comparative pathology is rapidly becoming more widely recognized, and the data collected at the zoo from animals coming from every part of the world are gradually forming a mass of high scientific value.

The Army Medical Advisory Board

The army medical advisory board is in future to consist of the director general, army medical services, as president; four civilian members of the medical profession appointed by the secretary of state for war; the president of the medical board of the India office (ex officio), when matters concerning India are under discussion, and a deputy assistant director general of the army medical department as secretary. The following have been appointed: president, Lieutenant General Sir Matthew H. G. Fell; director general, army medical services; chairman, Major General Sir Berkeley G. A. Moynihan; members: Major General Lord Dawson of Penn, Major General Sir Cuthbert Wallace, Prof. D. P. D. Wilkie; secretary, Major C. M. Drew. The board will advise the secretary of state on any question of policy in connection with army medical service on which he may desire to consult them. It has also been decided to appoint a committee, to be known as the army medical directorate consultative committee, constituted as follows: chairman, the director general, army medical services; vice-chairman, the deputy director general, army medical services; six civilian members of the medical profession who hold instructional or other appointments at university centers or medical schools, and one civilian member of the chemical warfare committee, and a secretary. The committee will advise the director general, army medical services, as to the supply of candidates for the regular royal army medical corps and its reserves; as to post-graduate and other courses of instruction for officers, and as to such administrative or professional questions as may be referred to it.

Boys Mature More Slowly Than Girls

In an address on a study of growth in children before the Royal Anthropological Institute, Miss R. M. Flemington stated that she had observed about 5,000 children over a period of eleven years and had followed about 700 of them to adult growth. She found that growth in the girl practically ceases between 15 and 16 and in many cases earlier. In the boy, however, growth is prolonged until 18 and often later. There is a marked psychologic difference. The girl, having to get her growth over in a much shorter period and doing it in rather a jerky way, tends to go through a phase lasting from twelve to eighteen months, when she is disinclined for any physical or mental exercise and welcomes group control and routine. The boy, on the other

hand, usually has a marked freeing of energy and wants to undertake some particular individual task outside routine, and he tends to resent group control. This is possibly the reason for the statement so often made by teachers that girls are generally more conscientious than boys. One very vital fact is the importance of more frequent medical supervision during adolescence. Miss Flemington cited several cases in which rapid growth was followed by severe illness. This could have been avoided if medical observation had been possible.

Martyrs to Radium

In a press interview Mr. Hayward Pinch, F.R.C.S., who has been medical superintendent for twenty years of the Radium Institute, states that three of his staff—a nurse and two laboratory assistants—have died from devotion to the work of the institute. He himself nearly died. His blood was affected by the rays and he was an invalid for five months. Now every precaution is taken. Every worker in the institute has two days' holiday a week. The work of making up the apparatus is done by relays of workers, and no one is allowed to do it for more than three months. Mr. Pinch has seen radium first scoffed at, then tolerated, and lastly acclaimed by physicians throughout the world. Hospitals are now clamoring for it. At first the institute treated only hopeless cases of cancer—cases in which every other known recourse had been tried and found futile. In spite of that, some really spectacular results were obtained. Now the surgeons are sending cases in the early stages, and the cures equal anything done by the radium institutes on the continent—which, unlike our own, are subsidized by the state and can pick their own cases. Everywhere hospitals are demanding radium. They will have to remember that it is a double-edged tool. Radium used with imperfect knowledge is likely to do more harm than good.

The Blood Transfusion Service

The type of service being rendered by the blood transfusion service of the British Red Cross Society is shown by the work carried out last year. Calls received for donors of blood totaled 1,933, as against 737 in 1926. In 1927 there were 1,923 calls. The actual number of transfusions during 1928 was 1,215. Exclusive of private houses and nursing homes, ninety-five hospitals made use of the service without fee or expense. Reports show the following results of transfusions: good or very good, 57 per cent; satisfactory improvement, 22 per cent; improvement followed by death, 14 per cent, and no appreciable result, 7 per cent.

Drug Addiction Among Women

"We have seen too frequently reports of suicides or deaths of able, clever, young women who have, in a life of excitement, become addicts to some form of drug," said Dr. Catherine Chisholm, president of the Medical Women's Federation, speaking at a meeting of the Society for the Study of Inebriety on "Alcohol and Drug Addiction in Relation to Women and Children." She began by a warning to the thousands of women who drink tea or coffee on every possible occasion. "The stimulating effect of tea or coffee drinking," she said, "becomes such a habit among women that in many homes no meal is complete without tea or coffee." One of the sources of the drug-taking habit was taking drugs under medical advice to relieve pain and to give sleep. Persons most susceptible were those of the highly developed nervous type, often the professional women—nurses, physicians or dentists—who have access to drugs and frequently work under stress; or actresses, society women, or professional women of the underworld. They became drug addicts to morphine or cocaine. Once the habit was contracted, it was exceptionally difficult for women to recover. The number of cases had apparently increased, especially among younger women. This was not surprising, for the greater freedom of women's lives nowadays made it easier to obtain drugs.

PARIS

(From Our Regular Correspondent)

Dec. 5, 1928.

Anticolibacillary Serotherapy

Professor Vincent presented before the Academie de médecine a new report on the investigations he has been making on anticolibacillary serotherapy. He cited cases of septicemia, pyelonephritis, complicated appendicitis and other diseases due to *Bacillus coli* in which he obtained healing or considerable improvement. On the other hand, the serum is almost inactive in simple carriers whose urine is not purulent. This method may be considered a useful supplement to the treatment of colibacillary infections that form secondary complications of renal and vesical lesions. In patients infected with *B. coli* the preventive serum injection is indicated the day before or on the day of the operation. According to Professor Vincent, it is probable that the various kinds of *B. coli,* whatever may be their particular reactions, are equally able to secrete the two essential toxins; i. e., enterotropic endotoxin and neurotropic exotoxin. The serum, which he prepared by inoculating horses, is both antitoxic and antiinfectious. But there are other bacilli frequently associated with *B. coli* on which the serum, being essentially specific, does not react. Streptococci and *Proteus vulgaris* (*Bacillus proteus*), however, are the only really dangerous ones. The others are unimportant; *B. coli,* as soon as eliminated by the serum, disappears spontaneously.

New Professorial Chairs

Two new professorial chairs have just been established in Paris. The first is the chair of phthisiology, whose holder is Dr. Leon Bernard, formerly of the chair of hygiene, which is now occupied by Professor Tanon. In his opening lecture he attempted to justify phthisiology as a specialty on account of the social rôle of tuberculosis. Then he explained his future course and stated the three distinct parts of it: (1) elementary instruction for students, comprising lectures and clinics; (2) courses for physicians who wish to improve their knowledge of phthisiology, and (3) particular preparation for specialists of dispensaries or sanatoriums. The second chair is devoted to hydrology and to therapeutic climatology. Its first occupant is Dr. Villaret. In his inaugural lecture he traced the history of hydrology from antiquity to the present fashion of water cures, culminating nowadays in the organization of hydroclimatic medicine. He then paid homage to the masters who conceived the importance of teaching crenotherapy and climatology, Trousseau, Gubler, Hayem, A. Robin, Gilbert and Carnot. After this Villaret outlined his teaching plans, consisting of bedside clinics and educational trips; he finished by asking for the creation of a hydroclimatothalassotherapeutic service in the hospitals of Paris. At the same time, the Faculty of Medicine in Lyons inaugurated another chair of hydrology and climatotherapy whose first occupant is Dr. Piéry. Together with the chairs in Paris, Bordeaux, Toulouse and Montpellier, there are five chairs in France established for this specialty, justified by the great number of thermal sources in the country.

A Conference on Professional Secrecy

The Confédération des travailleurs intellectuels has organized a forum on professional secrecy. The lawyer Henry-Robert, formerly president of the order of barristers in Paris and now a member of the Académie française, presided at the meeting. He spoke on the inviolability of the professional secret under all circumstances and on the right of the physician to refuse to reveal secrets which he knows by virtue of his profession only. In November, 1927, a congress representing 17,000 physicians unanimously affirmed the intangibility of the professional secret. Professor Balthasar, professor of legal medicine on the medical faculty of Paris, thinks that, in the interest of the patient, it will sometimes be necessary to make exceptions and

that the physician ought to have the right of acting according to his conscience. He cited the case of a sick woman in Algiers whose blood test showed a high content of urea and who died of uremia. Her daughter had been accused of having poisoned her and was indicted. The physician, respecting the professional secret, refused to give a statement of the uremic condition of his patient. Fortunately, the daughter was acquitted in default of sufficient proof. In Germany, Professor Balthasar added, physicians may freely testify before the tribunal. On the other hand, the new law on social insurance (workmen's compensation) obliges the physician to transcribe his diagnosis on a number of administrative papers which circulate in the offices among many employees not bound by professional secrecy. Professor Balthasar sees only one remedy for this ambiguous situation and that is to compel the patient to release the physician from secrecy by a written statement or to declare that the physician, under state medicine, is not acting as an ordinary practitioner but as a sworn expert and therefore freed from secrecy, like the physicians of the accident and life insurance companies.

Sporomycosis of Grain Peelers

Pasteur Vallery-Radot and Paul Giroud described a new disease which appeared last summer and the summer before in a small malting works in the east of France among people who worked at the peeling of grains. It is an infection of the lungs caused by *Aspergillus fumigatus* and *Mucor mucedo,* fungi which were found in considerable number on the corn that was malted. The specific aspergillar infection was demonstrated by intradermal reactions and positive precipitin reactions with aspergillus extracts. Aspergillus had only an antigenic power, while the mucor did not cause any humoral reactions. The disease, which the authors call estival sporomycosis of grain peelers, is not exceptional. It is the first time, however, that it has been reported in France. In the disease observed by Pasteur Vallery-Radot and Giroud the spores do not proliferate in the respiratory tract; their presence in considerable number and probably the absorption of toxic substances were the only reasons for local and general symptoms of the disease and for humoral reactions.

International Congress of Women Physicians

The International Association of Women Physicians, which comprises representatives of twenty-four nations, will hold its next quinquennial congress in Paris, April 11-13. At this occasion, the French Association of Women Physicians will present an urgent appeal to all women physicians provided with a diploma of the French government and to women students of medicine with twelve inscriptions, in order to solicit a close cooperation in their heavy task. It reemphasizes that its aim is to create a bond of solidarity among its members by giving them a chance to get acquainted, to help one another and to investigate together questions of general interest which are in the field of their activity. To join the French Association of Women Physicians, one should send the fees to the treasurer, Madame le dr. Requin, 154, avenue Emile Zola, Paris. The amount is 25 francs for doctors of medicine (adherent members) and 5 francs for students of medicine (auxiliary members).

The Winner of the Medical Literary Prize

Some time ago the *Siècle médical* announced a competitive prize for the best novel written by a physician, which would furnish an original and rather scientific study of social facts. Eighty-five manuscripts were submitted to the jury, which was composed of prominent literary people and members of the Académie française. The jury found several works of value among them, especially the one which was unanimously awarded the prize and which will probably be counted among the best literary productions of our time. It is "Noel Mathias," by Dr. Gilbert Robin, a curious study of a case of cerebral and sentimental impotence in which the author creates a striking type by his precision and his originality. The author uses the name of Gil Robin; he is 35 years old. He has had a brilliant medical career and was appointed, by competition, physician-general of asylums. During the war, he was decorated with the Legion of Honor for heroic deeds and a shrapnel wound. He is now head physician of the Assistance des enfants nerveux, retardés et instables of the Institut de Limours pour enfants arrierés and of the Oeuvre des blessés nerveux de la guerre. Highly cultured, he has published already five remarkable novels. The prize was given to him at a banquet at which Louis Barthou, minister of justice and member of the Académie française, presided.

AUSTRALIA

(From Our Regular Correspondent)

Dec. 21, 1928.

Cancer Campaign in Western Australia

The Perth Hospital is proposing to establish a modern cancer treatment center, equipped with facilities for high voltage roentgen therapy and radium appliances, and a public appeal for £5,000 was made. This was rapidly subscribed, and the hospital committee, encouraged by its success, has decided to continue the appeal for another month and increase the magnitude of the proposal accordingly. The Commonwealth and Western Australian governments have already granted £5,000 each for this purpose.

The distribution of radium throughout Australia from the national radium bank of the commonwealth government has stimulated local activities in the provision of the necessary buildings and appliances for its application for the cure or relief of malignant growths.

Queensland's Governor: A Medical Man

It is seldom that a man gains distinction in the medical, military and viceregal fields; yet such has occurred in the case of Sir John Goodwin, K.C.B., C.M.G., D.S.O., F.R.C.S., who was appointed the state governor of Queensland in 1927. Descended from a medical and military stock, he saw service in Shabkadar and Mohmand in 1897, was a surgical specialist in India from 1907 to 1911, served in the Great War in the retreat from Mons and the battles of the Marne and the Aisne, commanded the Fourteenth General Hospital during 1916, was a member of Mr. Balfour's mission to the United States in 1917, and was the director general of army medical services from 1918 to 1923. He has been honored by America (distinguished service medal), Italy (order of the crown), and Belgium (order of Leopold and croix de guerre). Since his arrival in Queensland he has endeared himself to the people and has especially interested himself in the health and hospital services. His tactful influence in the improvement of these is of great value.

Tasmanian Hospital Administration

The chief inspector of charities in Victoria, and secretary of the charities board (Mr. R. J. Love), has submitted a report on the hospitals in the state to the Tasmanian government. The hospitals in Tasmania operate as individual units, and that system is responsible for the lack of coordinated efficiency necessary for successful hospital management. Each hospital is controlled by a board appointed by the state government.

The Hobart general hospital has been under a cloud for the last ten years. The trouble commenced by the decision of the state government that the hospital should be available for all classes of the community irrespective of their varying financial positions. The honorary medical staff, through the local branch of the British Medical Association, protested that its gratuitous services were given to the institution in the interest of the sick poor only; the government remaining inflexible, the medical staff adopted the only course possible and resigned in a body. The government called for applications for the position of

surgeon superintendent of the institution, and a person was appointed who possessed only a certificate or diploma of what seemed to be a bogus American night college. This appointment was severely criticized, and the government replied by the gilbertian expedient of passing a special act of parliament that legalized the registration of this person. He was subsequently allowed to engage in private practice as well as to perform his hospital duties. Attempts have been made by the Tasmanian branch of the British Medical Association to straighten out this extraordinary situation, but the attitude of the state government has made such endeavors unavailing and an impasse exists.

NETHERLANDS

(From Our Regular Correspondent)

Nov. 15, 1928.

Yellow Fever

The public health service of the Dutch East Indies has presented to the committee of the International Bureau of Health a series of communications on yellow fever, which serves to recall the fact that, for the Orient and also for the Dutch East Indies, the transmission of yellow fever is still an epidemiologic problem of the first magnitude. The danger of transmission by way of America has ceased to exist, for the reason that yellow fever has been exterminated there. The danger threatens the Orient from Africa, and is greater than it would otherwise be because of the unknown extent of the region in Africa in which yellow fever is endemic. The danger is increasing daily, so to speak, as a result of improvements in the means of communication, and at present demands close attention on the part of the public health services in the Orient.

Vaccination Against Scarlet Fever and Diphtheria

Madame De Vries-Bruins, member of the lower house, submitted to the minister of labor, commerce and industry the following questions pertaining to vaccination against scarlet fever and diphtheria: 1. Is the minister acquainted with the fact that the Inspection du département de l'état concerning public health is distributing, in the various schools of the country, a circular leaflet endorsing, and recommending the introduction of, vaccination against scarlet fever and diphtheria —in which leaflet these two statements occur: "No child need die from scarlet fever or diphtheria if the parents will have it vaccinated in time against these diseases," and "A child properly vaccinated does not contract scarlet fever or diphtheria"? 2. Does the minister consider that the affirmation contained in these two statements is in accordance with the experience acquired to date in our country in connection with the crusade against scarlet fever and diphtheria? 3. If so, is the minister willing to make known (citing the source of his information) in how many cases such active immunization has been applied and to state whether or not the children were actually immunized against scarlet fever and diphtheria? 4. If the two statements cited are not in accordance with the results of experience, does not the minister regard them as prejudicial to the crusade against the two main contagious diseases? 5. If so, has the minister decided to take action against the parties responsible for the distribution of such circular leaflets? To the foregoing questions, the minister of labor, commerce and industry replied as follows: 1. On inquiry, it has developed that such a circular leaflet was distributed on the authority of a health officer of the state department of public health. 2. Although the results secured in the crusade against scarlet fever and diphtheria are encouraging, the minister is of the opinion that the statements cited are too optimistic. 3. It is estimated that 50,000 persons have been vaccinated against diphtheria, 15,000 against scarlet fever, and 1,500 against the two diseases simultaneously, making a total of 66,500 persons. The number of cases amounts to about 20,000. From information received from the regions in which vaccinated and unvaccinated persons have been attacked, it appears that the number of vaccinated patients was notably less than the number of unvaccinated. Furthermore, the disease took a more favorable course in the vaccinated. 4. It should be said that with the publication of such circular leaflets, which lack the support of demonstrated facts and awaken too optimistic hopes, a more exact knowledge of the results of the crusade against the two diseases might give rise, among the general public, to an unwarranted skepticism toward the measures applied. 5. The minister has decided to prohibit the further publication of articles containing such statements.

The Dangers of Roentgen Rays

Verslagen en Mededeelingen betreffende de Volksgezondheid, 1928, number 3, contains a supplementary report concerning the dangers connected with the use of roentgen rays and other similar rays. The main report appeared in 1926, and the commission has now published some supplementary considerations on portable x-ray apparatus. The commission wishes to point out that the dangers which exist in the production and application of roentgen rays can be controlled. It suggests also a legal control of the production and application of roentgen rays, and recommends the following regulations: 1. X-ray apparatus that offers sufficient security where it stands should not be transported to places in which it will be an increased source of danger. It should be provided with special forms of protection to prevent the unforeseen emission of rays. 2. Only physicians should be permitted to use such apparatus, and, furthermore, only those who have received a special course of training under the supervision of the state.

The commission will not consider its task completed until it has brought to the attention of every one the dangers involved in the application of roentgen rays. The harmful effects of the rays are not observed immediately. Weeks or months may elapse before roentgen "burns" become manifest, and then they are usually resistant to all forms of treatment. In most cases, ignorance in the use of rays is the cause of "burns." The operation of some of the apparatus constructed nowadays is as simple as turning on an electric light, and the physicians who buy such apparatus (chiefly rural physicians) should be warned of the dangers to which they expose themselves. The state department for medicine regards it as its duty to inform physicians of the danger of such accidents, while the universities do the same for the students, when they instruct them in the diagnostic and therapeutic uses of the rays.

The Retirement of Professor Eijkman

Dr. C. Eijkman, professor of hygiene and sanitary police work, having reached the age limit of 70 years, has been permitted to retire. He gave his farewell lecture in the Great Hall of the University of Utrecht.

Preserved Foods

Reference has been previously made to recent modifications in the text of the law pertaining to the preparation and sale of preserved foods. A general law prohibits the sale of any food substance that is harmful to health. Regulations have likewise been imposed concerning the use of preservatives. Preservatives are not prohibited, in general, but only with reference to special foods, such as bread, flour, lactose, fruit preserves, jelly, fruit syrups, sausages, meat extracts, cocoa, chocolate, coffee, tea, milk and liquid derivatives of milk, honey, vinegar, fats and oils.

Butter is not mentioned specifically, and it is not quite clear whether preservative substances are permissible or not; that is to say, whether or not it is classed among the fats. Benzoic acid may be used in margarine, and sulphuric acid, benzoic acid and salicylic acid in certain other food substances. Harmless coloring matter is permitted in certain foods, which are specified. The restrictions apply likewise to foods destined to be used aboard ship. With the exception of butter and honey, they are

not applicable to products to be exported, provided these are not found in a store, on the market or in some place open to the public.

The Seventieth Birthday of Dr. Josephus Jitta

Special ceremonies were held in honor of the seventieth birthday of Dr. Josephus Jitta, president of the public health service. Jitta began his career as an oculist in Amsterdam. He devoted himself later more particularly to the crusade against trachoma. Since 1905, he has been engaged exclusively in public health work. He was the representative of the Netherlands to the International Bureau of Public Health, and since 1905 has been a member of the committee on hygiene of the League of Nations.

BELGIUM

(From Our Regular Correspondent)

Nov. 12, 1928.

International Congress Against Alcoholism

The nineteenth International Congress Against Alcoholism was held in Antwerp, under the patronage of the king and queen of Belgium and Cardinal Van Roey. The session was under the chairmanship of Dr. Edgard Zunz.

Alcoholism was studied from the sociohygienic, the economic, the philosophic and the physiologic points of view. The pathologic, criminologic and legislative aspects of the problem were variously emphasized, depending on the country (United States, Sweden, Belgium, Russia). The relations to education and to sport activities also were taken up; the question of the substitution of fruit juices, the question of beers, wines, ciders and liqueurs, and the question of police work in connection with alcoholism were likewise considered.

Insurance and medicolegal questions associated with traffic accidents were considered comprehensively by Prof. J. Firket of Liége, who referred to the communication that he presented, in collaboration with Renaux and De Craene, before the Congress of Criminal Anthropology held previously in Paris. Traffic accidents are numerous at the present time, and are due, in part to the consumption of alcoholic beverages.

Professor Pusepp of the Neurologic Clinic in Tartu (Dorpat) presented some interesting data from the medical and the physiopathologic points of view. Intoxication, he stated, may result from small amounts of alcohol or from large amounts, depending on the relative functioning of the suprarenal capsules; hyperfunctioning of the thyroid accelerates the intoxication process. These facts explain the unequal resistance of different persons, and of the same person at different times, to the various alcoholic beverages.

The present Belgian law pertaining to spirituous beverages was the subject of several communications, all of which tended to confirm the good results secured and to favor its continuance.

The Crusade Against Syphilis

Addressing the Royal Academy of Medicine of Belgium, M. Bayet told recently of the progress that had been made in Belgium in the crusade against syphilis. In less than five years, syphilis has diminished 80 per cent—from the standpoint of recent infections—throughout the entire country. This extraordinary improvement has been brought about by the application of a simple plan of campaign that embraced two essential principles: (1) Social prophylaxis of venereal disease should consist in the sterilization of germ carriers on a therapeutic basis; (2) such prophylaxis cannot be effective unless it has the voluntary and enlightened collaboration of the whole medical body. The conditions under which this plan of campaign has been applied give it the value of an experience, which has awakened considerable interest in foreign countries. A new inquiry based on the years 1926 and 1927 has just been completed. The impression that one gets from the report is that, during those two years, the diminution in the incidence of syphilis has been maintained not only among the civil population but also in the army. Of late, however, serious restrictions have been placed in the way of realizing the original plan of campaign, as it has been necessary to restrict the budgetary allowances. The 400 free antisyphilitic consultations have been reduced to eighty, and the availability of treatment for all patients and sterilization by therapeutic methods have become less general. The medical body, as a whole, no longer takes part in the campaign. The consequences of these changes may be grave unless some modifications are introduced.

M. Bayet emphasized the importance of the intensified activities of the Ligue nationale belge contre le péril vénérien, which have been carried out in a systematic manner and have taken on a double form of publicity campaign: sanitary propaganda and the work of moral education. But, in view of the curtailment of funds, the question arises whether the results accomplished can be made permanent. Bayet fears they cannot be. He mentioned, first, the precarious situation in the large cities and among the congested working populations in France, where syphilis is frankly in recrudescence in nineteen departments. The experience of France should convince us that the campaign cannot be effective and the results cannot be made permanent unless all the measures of the campaign are applied as a whole.

In general, the results have been maintained in Belgium thus far, but there are foci of recrudescence due to the relaxation of vigilance imposed by the curtailment of funds. Only a few new cases are involved, but it is evident that the danger is ever present and that it may break forth anew at any time. Safety lies in returning to the principles that have been tried and found effective. The aid of the whole medical body must be enlisted in the campaign, and treatment must be everywhere readily available to all patients. At the beginning of the campaign, Bayet set the absolute extinction of syphilis as the goal and that is possible if our energies are bent to its accomplishment. Social problems are considered as matters of business; thus the crusade against syphilis should be conducted as a business venture. Every year, syphilis costs many millions of francs owing to the vast numbers that are incapacitated from work and require expensive treatment.

Medicolegal Diagnosis of Drunkenness

The Société de médecine légale of Belgium, cognizant of the value of an early diagnosis of drunkenness in connection with many judicial decisions, particularly in the matter of crimes and traffic accidents, has appointed a committee to inquire into the best means of establishing such a diagnosis. It has directed the attention of the judicial authorities to the importance of this by dispatching a circular letter to the attorney generals of the various courts of appeal in the country. It is desirable, with this purpose in view, to reduce the establishing of a diagnosis of drunkenness to a definite system, by an early clinical examination, and, whenever possible, by an examination of the blood and the urine for the determination of the amount of alcohol they contain.

Address of Professor Steindler

Professor Steindler of the University of Iowa recently delivered an address before the Société belge de chirurgie on the functional restoration of a paralyzed arm and on the treatment of scoliosis.

Tuberculosis in the Merchant Marine

The question of recruiting the personnel of the merchant marine in such a manner as to eliminate the tuberculous is again being brought up. The question was discussed before the Congress of Hygiene, and the conclusion was reached that a thorough medical examination should be made at the time sailors are engaged for the merchantmen, so that tuberculous applicants may be discovered and prevented from entering the maritime service. The medical examination should be renewed as fre-

quently as possible, in order to detect cases of tuberculosis in process of evolution and to remove those affected from the service. Finally, tuberculous subjects thus removed from the maritime service should receive medical care and, if need be, financial assistance. Such patients are entitled to the benefits of invalidity insurance. The question deserves to be settled before long, and the matter regulated in a definitive manner.

Creation of a Belgian Royal Colonial Institute

A royal decree has established a Belgian royal colonial institute. Similar institutes exist in all large countries possessing colonies. More particularly, the royal colonial institution of Amsterdam has awakened appreciation of the very important services that a central colonial institute can render when it carries on scientific researches and serves as a clearing house of practical information in connection with the economic problems that affect the colonies. Many organizations in Belgium are engaged in the study of colonial problems, such as native politics and jurisprudence; agricultural and industrial colonization; transportation problems, and equipment for the colonies. Now their activities will be concentrated and a unity of direction will be established. It is desirable that interest in the colonies be developed in the universities and in other institutions of higher learning. The young people of the country should become familiar with colonial needs and colonial services, for that would aid later in procuring physicians, civil engineers, magistrates and administrators whose knowledge and experience would contribute to the efficient administration of the colonies and to the prosperity of colonial enterprises.

The Institut royal colonial belge is divided into three sections. The first section, of moral and political sciences, deals particularly with questions pertaining to history, native politics, colonial legislation, ethnology, languages, literature and missions. The second section, of natural and medical sciences, deals with questions of physical and commercial geography, geology, chemistry, botany, zoology and entomology, hygiene and medicine, agriculture and animal husbandry. The third section, of technical sciences, handles problems pertaining to transportation, communications, civil engineering, colonial equipment, implements and mine exploitation.

BERLIN

(From Our Regular Correspondent)

Dec. 29, 1928.

Criteria for Use of Arsphenamine Preparations

The council of the federal public health service has set up new criteria for the use of arsphenamine preparations. Before treatment is begun, the patient should be carefully questioned concerning his former illnesses and as to his present state of health. Likewise, a careful examination (heart, urine) should be made.

During acute disturbances of health, though of a mild nature ("cold," sore throat, indigestion), injections of arsphenamine preparations should be given with great caution and only under especially important indications. In disturbances of a more severe nature, arsphenamine preparations should be entirely omitted; likewise, in the case of persons who did not tolerate well the last injection of arsphenamine and are still suffering from its effects. Injections of arsphenamine should not be given on an empty stomach or after a heavy meal.

Especial care in the use of arsphenamine preparations is necessary also in markedly undernourished, cachectic and highly anemic patients; patients with status thymolymphaticus; diabetes, goiter, exophthalmic goiter and Addison's disease; pulmonary tuberculosis; disturbances of the heart and blood vessels; diseases of the liver and the digestive organs; obesity, alcoholism and erysipelas, and diseases of the kidney, or when kidney disease is suspected; likewise in pregnancy. In such cases, one should proceed cautiously with trial doses, and go over to full doses only if the trial doses are well borne. Similar precautions should be observed in the case of syphilitic patients with manifestations indicating involvement of the central nervous system.

The size of the doses to be used in intravenous injections must be determined on the basis of the body weight, the general condition of the health, and the seat, nature, severity and extent of the existing syphilitic manifestations. For the first injections small doses are recommended (dosage I and II = from 0.1 to 0.2 Gm. of arsphenamine, from 0.15 to 0.3 Gm. of neoarsphenamine or sodium arsphenamine, 0.1 Gm. of silver arsphenamine, from 0.1 to 0.3 Gm. of neo-silver arsphenamine; in sturdy young men, at the most dosage III = 0.3 Gm. of arsphenamine, 0.45 Gm. of neoarsphenamine or sodium arsphenamine, 0.25 Gm. of silver arsphenamine, from 0.3 to 0.4 Gm. of neo-silver arsphenamine) and for the later injections the larger doses are advised (dosage III and IV = from 0.3 to 0.4 Gm. of arsphenamine, from 0.45 to 0.6 Gm. of neoarsphenamine or sodium arsphenamine, from 0.25 to 0.3 Gm. of silver arsphenamine, from 0.3 to 0.45 Gm. of neo-silver arsphenamine). Even for the purpose of abortive treatment, and though the patients are strong and otherwise healthy men, dosage IV (0.4 Gm. of arsphenamine, 0.6 Gm. of neoarsphenamine or sodium arsphenamine, 0.3 Gm. of silver arsphenamine, 0.45 Gm. of neo-silver arsphenamine) and in women dosage III (0.3 Gm. of arsphenamine, 0.45 Gm. of neoarsphenamine or sodium arsphenamine, 0.25 Gm. of silver arsphenamine, 0.4 Gm. of neo-silver arsphenamine) should not be exceeded as a single dose.

The dosage for infants per kilogram of body weight varies as follows: arsphenamine, from 0.007 to 0.02 Gm.; neoarsphenamine or sodium arsphenamine, from 0.01 to 0.03 Gm.; silver arsphenamine, from 0.005 to 0.0075 Gm., and neo-silver arsphenamine, from 0.007 to 0.025 Gm.

A few days should be allowed to elapse between intravenous injections. In administering the larger doses (dosage III in women, and dosage IV in men) an interval of from three to seven days is required, but in using the smaller doses the injections can be given at shorter intervals.

The total amount of arsphenamine that may be administered intravenously to a patient within an interval of six weeks, when only arsphenamine is employed, should not ordinarily exceed from 2.5 to 3.0 Gm. of arsphenamine, from 4.0 to 5.0 Gm. of neoarsphenamine or sodium arsphenamine, from 2.0 to 2.5 Gm. of silver arsphenamine, or from 4.0 to 4.5 Gm. of neo-silver arsphenamine. For a thorough complete treatment the following totals, varying with the type of substance, are recommended: for men: from 3.0 to 4.5 Gm. of arsphenamine, from 4.5 to 6.0 Gm. of neoarsphenamine, from 2.5 to 3.5 Gm. of silver arsphenamine, from 4.0 to 4.5 Gm. of neo-silver arsphenamine; for women: from 2.5 to 4.0 Gm. of arsphenamine, from 4.0 to 5.0 Gm. of neoarsphenamine or sodium arsphenamine, from 2.0 to 3.0 Gm. of silver arsphenamine, or from 3.5 to 4.0 Gm. of neo-silver arsphenamine. However, if there is any special occasion for it, these doses may be exceeded if the patients are otherwise sturdy. The use of the maximal amounts is permissible, however, only when the treatment continues to be well borne. If arsphenamine is combined with bismuth or mercury, cautious administration, together with close observations of the patient during the treatment, is required.

During the treatment, especially on the day of the injection, patients should avoid unusual bodily exertion and excesses of any kind. After the injection, patients should be allowed to rest in a reclining position for a quarter of an hour or so.

Patients should be instructed to call the physician's attention unasked to any disturbances occurring after an injection, such as headache, nausea, dizziness, vomiting, fever, weak spells, sleeplessness, flushing of the face, hemorrhages, skin eruptions, loss of weight, or a decrease in the total amount of urine passed. Occurrences of this kind are warning signals. If they are of a serious nature, the series of treatments should be interrupted,

and the injections should be renewed at the earliest a week after the patient has fully recovered, and then either a smaller dose should be given or a different arsphenamine preparation should be employed. After the first injection, in recent syphilis, not infrequently there will be a slight rise of temperature (or sometimes a chill) that passes away soon. These do not necessarily constitute a contraindication to the continuation of treatment. However, all increases of temperature during the further course of treatment invite caution.

An especial watch should be kept for the appearance of exanthems, though only of a mild and fugitive nature, as they are easily overlooked. If there are such manifestations, treatment should be at once discontinued. In the milder exanthems it should be discontinued for at least fourteen days, and if a general dermatitis develops, it should be postponed indefinitely. A specialist should be consulted before treatment is resumed.

In connection with combined treatment (arsphenamine and bismuth or arsphenamine and mercury), the by-effects of the preparations must be kept in mind. It is advisable in recent syphilis, before the appearance of general manifestations, especially if the Wassermann reaction is still negative, to begin with an injection of arsphenamine.

In the administration of all arsphenamine preparations, strict asepsis should be observed. In every case, the control number of the preparation used and the place where it was obtained should be recorded, in case difficulties should arise. Arsphenamine preparations should be secured solely from the drug stores or pharmacies.

Solutions of the various arsphenamine preparations should be made immediately before they are to be used, and they should be injected with great care and with full consideration of the directions that accompany each package. Dissolving the preparations in the syringe is not a good practice. For the preparation of solutions one should use sterile, freshly distilled water slightly warmed but not heated above body temperature. It is advisable to redistil the water for the solution of preparations, for which purpose vessels of quartz or Jena glass should be employed; or one may use the sterile distilled water that is marketed in ampules. Only absolutely clear solutions of arsphenamine preparations may be injected. They must be free from visible particles.

Since all arsphenamine preparations—particularly, neoarsphenamine and sodium arsphenamine—are easily decomposed on the admission of air and become then more poisonous, each ampule of the preparations should be carefully examined, before it is used, to ascertain whether or not it is intact. The contents of defective ampules must not be used; nor may one use remnants of ampules previously opened, or preparations that show discoloration. The freshly prepared solutions should be used at once. It is not admissible to procure from the pharmacies solutions already prepared; nor should one prepare a large amount of solution with which to treat several patients in succession.

In giving intravenous injections, one should see to it that none of the arsphenamine solution is on the outside of the needle of the syringe and after the insertion that the needle is well within the vein and that the opposite wall of the vein will not be punctured during the injection. The injection should be given slowly, several minutes being taken. If there is the slightest feeling of pain, the slightest sign of the development of an infiltrate or the formation of a wheal, or any evidence of respiratory difficulty, the injection must be at once discontinued. Likewise, if one observes the slightest clogging of the syringe, the injection must be interrupted and should not be continued until the operator has assured himself, by drawing up blood into the syringe, that the instrument is in the proper position.

Arsphenamine treatment should be given solely by a physician who is thoroughly familiar with the technic and who conscientiously observes all necessary precautions.

Marriages

DOMINIC JOSEPH ZERBOLIO, Benld, Ill., to Miss Frances Linard of La Porte, Ind., Dec. 23, 1928.

ESTES H. HARGIS, Birmingham, Ala., to Miss Florence Parker of Dallas, Texas, Dec. 22, 1928.

JAMES FRANK DOUGHTY to Miss Alice Margaret Smither, both of Tracy, Calif., January 7.

MILTON KLUMB, Milwaukee, to Miss Helen Hawkins of Port Jervis, N. Y., Dec. 29, 1928.

JOSEPH LOUIS RANSOHOFF, Cincinnati, to Mrs. Jane Rice, at New York, January 1.

GEORGE ROSENBERG to Miss Clara E. Vogel, both of New York, Nov. 4, 1928.

JOHN V. DILLMAN, Louisville, Ky., to Mrs. Mary M. Lewis, in December, 1928.

SAM M. BROCK, Chicago, to Miss Julia Sholl of Peoria, Ill., Dec. 22, 1928.

Deaths

William Jackson Means ⊕ Columbus, Ohio; Cincinnati College of Medicine and Surgery, 1873; member of the House of Delegates of the American Medical Association, 1912-1914; one of the organizers, and formerly professor of surgery, registrar and treasurer, Ohio Medical University; at one time dean, professor of surgery and treasurer of the Ohio-Starling Medical College and dean and professor and head of the department of surgery, Ohio State University College of Medicine; past president and formerly chairman of the executive board of the Association of American Medical Colleges; for fifteen years chief of staff of the Protestant Hospital, now known as the White Cross Hospital; president of the Park Savings Company of Columbus for thirty years; aged 75; died, suddenly, January 17, of angina pectoris.

Frank Douglas Boyd ⊕ Fort Worth, Texas; University of Louisville (Ky.) School of Medicine, 1890; member of the House of Delegates of the American Medical Association, 1917-1918; past president of the State Medical Association of Texas; president of the Tarrant County Medical Society; formerly assistant to the chair of ophthalmology, otology, rhinology and laryngology at his alma mater; at one time professor of otolaryngology, Medical Department of Texas Christian University, and professor of rhinology and laryngology, Baylor University College of Medicine; aged 61; on the staff of the Baptist Hospital, where he died, January 4, of myocarditis and influenza.

Horace Manchester Brown ⊕ Milwaukee; Medical Department of the University of the City of New York, 1880; member of the House of Delegates of the American Medical Association, 1917-1928; past president of the Tri-State District Medical Association; on the staff of the Columbia Hospital; for many years in charge of the Lakeside Hospital, now out of existence; first lieutenant, M. R. C., U. S. Army, retired; author; editor of "Annals of Medical History Clubs"; aged 70; died, January 18, of heart disease.

Alexander Greer Drury ⊕ Cincinnati; University of Pennsylvania School of Medicine, Philadelphia, 1868; emeritus professor of hygiene, University of Cincinnati College of Medicine; formerly professor of dermatology, Laura Memorial Woman's Medical College; past president, secretary and treasurer of the Ohio State Medical Association; author of "Dante—Physician"; aged 84; died, January 17, of heart disease.

Elizabeth Hopkins Dunn, Chicago; Northwestern University Woman's Medical School, Chicago, 1894; member of the American Association of Anatomists; formerly on the faculty at her alma mater, Rush Medical College, and the University of Chicago; aged 61; died, January 16, at the Billings Memorial Hospital, of carcinoma of the mouth.

Martin Luther Hooper ⊕ Indianola, Iowa; College of Physicians and Surgeons, Keokuk, 1891; Medical Department of the University of Illinois, Chicago, 1898; past president and secretary of the Warren County Medical Society; served during the World War; for many years member of the city council; aged 60; died suddenly, January 7, of heart disease.

Albert W. Phillips, Derby, Conn.; Hahnemann Medical College and Hospital, Chicago, 1861; Civil War and Spanish-American War veteran; formerly mayor of Derby, and state

senator; at one time member of the state board of health; aged 90; died, January 15, of arteriosclerosis.

Harris Warren Crenshaw, Crenshaw, Miss.; Medical Department, Vanderbilt University, Nashville, Tenn., 1878; bank president; formerly member of the state legislature; aged 73; died, January 5, at the Methodist Hospital, Memphis, Tenn., following an operation.

Robert Vance Brawley ⊕ Salisbury N. C.; University College of Medicine, Richmond, 1901; member of the American Academy of Ophthalmology and Oto-Laryngology; bank president; on the staff of the Salisbury Hospital; aged 50; died, January 5, of pneumonia.

Robert Michael Birmingham ⊕ Lawrence, Mass.; Dartmouth Medical School, Hanover, 1884; formerly on the staff of the Lawrence General Hospital; aged 70; died, Nov. 27, 1928, of pneumonia, following a posterior gastro-enterostomy for ulcer of the stomach.

William Daniel Cronin ⊕ New London, Conn.; Columbia University College of Physicians and Surgeons, New York, 1900; on the staff of the Lawrence and Memorial Associated Hospitals; aged 53; died, January 19, at Ridgefield Park, N. J., of heart disease.

Lewis Edward Nelson ⊕ Hendricks, Minn.; University of Minnesota Medical School, Minneapolis, 1923; aged 35; on the staff of the Hendricks Hospital, where he died, Dec. 12, 1928, of a fractured spine sustained in an automobile accident.

Earl **Jerome Cripe** ⊕ North Manchester, Ind.; Indiana University School of Medicine, Indianapolis, 1910; president of the Wabash County Medical Society; aged 48; died, Dec. 29, 1928, in a hospital at Fort Wayne, of meningitis, following influenza.

Kent **Cato Hammond,** Dundalk, Md.; University of Maryland School of Medicine and the College of Physicians and Surgeons, Baltimore, 1925; aged 27; died, January 24, at the Maryland General Hospital, Baltimore, of pneumonia.

John **Mortimer Naff,** Talladega, Ala.; Medical Department of Vanderbilt University, Nashville, 1885; member of the Medical Association of the State of Alabama; aged 67; died, January 5, of chronic nephritis and myocarditis.

Jacob L. Everhardy ⊕ Leavenworth, Kan.; University Medical College of Kansas City, 1897; secretary of the Leavenworth County Medical Society; formerly county health officer; aged 54; died, January 23, of caries of the spine.

William Erwin Allen, Grand Rapids, Mich.; College of Physicians and Surgeons, Chicago, 1885; aged 70; died, January 4, at the Blodgett Memorial Hospital, of chronic myocarditis and bronchopneumonia.

Albert William Gernert, Myerstown, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1895; aged 56; died, Dec. 14, 1928, at the Hahnemann Hospital, Philadelphia, of carcinoma of the stomach.

Edward Robert Pfarre ⊕ Saranac Lake, N. Y.; Long Island College Hospital, Brooklyn, 1896; formerly on the staff of the General Hospital of Saranac Lake; aged 54; died, January 10, of angina pectoris.

Robert Scott Magee, Green City, Mo.; College of Physicians and Surgeons, Keokuk, Iowa, 1882; formerly on the staff of the State Hospital, Fulton; aged 74; died, January 8, of pneumonia.

Harry Edwin Rice, Springfield, Mass.; New York Homeopathic Medical College, 1883; member of the Massachusetts Medical Society; aged 68; died, January 21, of cerebral hemorrhage.

William Davis Noble, Newellton, La.; Medical Department of the Tulane University of Louisiana, New Orleans, 1912; aged 38; died, January 12, of pneumonia, following influenza.

Francis Marion Isom, Livingston, Mont.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1894; aged 70; died, Dec. 26, 1928, of heart disease and nephritis.

Orvil Burl Christie, Anderson, Ind.; State University of Iowa College of Medicine, Iowa City, 1891; aged 61; died, January 15, at the Proctor Hospital, Peoria, Ill., of pneumonia.

John Joseph Shaw, Plymouth, Mass.; New York Hygeio-Therapeutic College, New York, 1867; aged 86; died, January 16, of cerebral hemorrhage and bronchopneumonia.

Charles Edward Schenck ⊕ Sherman, Texas; Ohio Medical University, Columbus, 1897; on the staff of St. Vincent's Sanitarium; aged 58; died, January 2, of paralysis.

Herbert C. Wilson, Quitman, Ga.; Meharry Medical College, Nashville, Tenn., 1906; served during the World War; aged 42; died, in December, 1928, of pneumonia.

James Fairbairn Kerr, Jamaica, N. Y.; Eclectic Medical College of the City of New York, 1909; aged 61; died, January 18, in a local hospital, of heart disease.

John Younglove, Elizabeth, N. J.; Homeopathic Medical College of Missouri, St. Louis, 1861; Civil War veteran; aged 92; died, January 17, of chronic myocarditis.

George Davis Huddleston ⊕ Conway, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1891; aged 66; died, January 3, of cerebral hemorrhage.

Charles Kearns, Jr., Berkeley, Calif.; Medical College of Ohio, Cincinnati, 1893; aged 61; died, January 3, at Oakland, of chronic nephritis and arteriosclerosis.

John C. Gosnell, Seattle; Detroit College of Medicine and Surgery, 1888; aged 74; died, Dec. 24, 1928, of carcinoma of the pancreas and obstructive jaundice.

Wellington Brown Searls, Roselle Park, N. J.; Medical Department of Columbia College, New York, 1872; Civil War veteran; aged 85; died, Dec. 25, 1928.

Jacob B. Krout, Fremont, Iowa; College of Physicians and Surgeons, Keokuk, 1886; aged 72; died, January 12, in a hospital at Ottumwa, of septicemia.

Elizabeth Pauline Wolf Blitzsten, Chicago; Rush Medical College, Chicago, 1923; aged 34; died, January 30, at Rochester, Minn., of hyperthyroidism.

James George White ⊕ Mount Clemens, Mich.; Trinity Medical College, Toronto, Ont., Canada, 1885; aged 66; died, Dec. 20, 1928, of diabetes mellitus.

Robert J. Bell ⊕ Brooklyn; Long Island College Hospital, Brooklyn, 1887; on the staff of the Caledonian Hospital; aged 63; died, January 5, of pneumonia.

Clark Rankin Craig ⊕ Philadelphia; Jefferson Medical College of Philadelphia, 1893; aged 69; died, January 10, of lobar pneumonia and nephritis.

Hermann H. Seip, Pittsburgh; Hahnemann Medical College and Hospital of Philadelphia, 1905; aged 49; died, Dec. 29, 1928, of angina pectoris.

William Ezra Cole, Lake Mary, Fla.; Eclectic Medical College of Pennsylvania, Philadelphia, 1869; aged 86; died, in December, 1928, of senility.

William Cass Duncan, Salem, Iowa; Hahnemann Medical College and Hospital, Chicago, 1885; aged 63; died, Dec. 28, 1928, of heart disease.

Wade Hampton Bolton, Memphis, Tenn.; Memphis Hospital Medical College, 1884; aged 65; died, Dec. 19, 1928, of cerebral hemorrhage.

Archibald A. Chisholm, Manuels, Nfld.; University of Maryland School of Medicine, Baltimore, 1897; aged 62; died, Oct. 7, 1928.

Winston James Davie, Wrightsboro, Texas; Southern Medical College, Atlanta, 1885; aged 68; died, Dec. 5, 1928, of influenza.

Simeon Hull Smith, Culloden, Ga.; Atlanta College of Physicians and Surgeons, 1899; aged 74; died, Dec. 13, 1928, of paralysis.

James L. Gable, Brooks, Ga.; Atlanta Medical College, 1883; aged 68; died, January 12, of pneumonia, following influenza.

James Howard Dasher ⊕ Erie, Pa.; Medico-Chirurgical College of Philadelphia, 1903; aged 54; died, January 4, of pneumonia.

Cyrus Elbert Hunt, Wichita, Kan.; Detroit Medical College, 1870; Civil War veteran; aged 88; died, January 6, of pneumonia.

Dudley Benedict Day, Coudersport, Pa.; Eclectic Medical Institute, Cincinnati, 1877; aged 81; died, January 14, of pneumonia.

Henry M. Clewell, Cleveland; Columbus Medical College, 1876; aged 82; died, January 11, of pneumonia, following influenza.

Jacob Jordan Parker, Normal, Ill. (licensed, Illinois, 1878); Civil War veteran; aged 82; died, in January, of heart disease.

John H. T. Sweet, Hartford, Conn. (licensed, Connecticut, 1893); aged 79; died suddenly, January 7, of heart disease.

William Scott Griffith ⊕ Johnstown, Pa.; Baltimore Medical College, 1898; aged 53; died, January 5, of pneumonia.

Bureau of Investigation

LESSER SLIM FIGURE BATH

Another Elaborately Exploited Piece of Quackery for Fooling the Fat

To any person who has made a study of contemporary quackery, it is apparent that in some fields it seems impossible to devise a humbug too crude to cause its rejection. Nowhere is the "will to believe" quack advertising more in evidence than in the "obesity cure" field.

During the past few months there has been put on the market a preparation sold under the name of "Lesser Slim Figure Bath," which is described as "The Sensation of Europe" that, by its "mysterious action," will reduce the weight of the fat "regardless of your diet." It comes from Berlin—if one is to believe the advertising—and is the invention of Herr Felix Lesser, who, it is claimed, submitted "his remarkable discovery" to "the eminent Dr. G. Braun of Berlin." The eminent doctor's report is part of the Lesser Slim Figure Bath advertising. Nor was this all:

"Scores of experiments were made with typical German thoroughness. The Chief Physician of a great Berlin Hospital used 400 packages to make exhaustive analyses to determine its harmlessness. Persons afflicted with heart trouble, kidney trouble, nervous disturbances and various skin disorders were subjected to sixteen baths in four weeks. The results proved the preparation to be absolutely harmless.

"To determine its effect upon the skin, 200 packages were used on 10 nurses and internes from his own staff. After taking 20 baths in 40 days, all found that their skins were softer, smoother and beautifully free from blackheads, pimples and blemishes.

"Without any change in diet or mode of living, 70 persons were selected to prove the effectiveness of the Slim Figure Bath in reducing. Using 1,400 packages for this group, giving each 20 baths, these results were obtained: 20% lost about 10 pounds. 40% lost about 8 pounds. 20% lost about 7 pounds. 10% lost between 5 and 7 pounds, and 10% lost very little or nothing."

We are then told that "the discoverer, Herr Lesser of Berlin, Germany, has now brought his secret formula to America." And, of course, an American company has been formed—the Lesser Company, incorporated under the laws of Illinois, May 29, 1928, with an authorized capital stock of $150,000. The officers and directors of the company, and the amount of stock subscribed by each, follows:

PRESIDENT, H. E. Waldron; subscribed $10,000.
SECRETARY, Harold O. McLain; subscribed $10,000.
TREASURER, John J. Mitchell; subscribed $25,000.
DIRECTOR, Leroy A. Kling; subscribed $1,000.
DIRECTOR, L. E. Corrington; subscribed $9,000.

Just what qualifications these men have for going into the field of therapeutics it is difficult to see. Mr. Waldron is connected with a fountain pen concern, Mr. McLain is with an ice company, Mr. Mitchell is with a prominent Chicago bank, Mr. Kling is president of an advertising agency while Mr. Corrington is connected with an investment security house.

Nude girls dancing across the page, a naked woman in a bath tub and other pictures of female nudity in black and white and colors characterize the advertising of Lesser Slim Figure Bath. A seeming respectability is given by the Teutonic slant—a trick well known to quackery. Dr. Paul Mueller, chief chemist of the Chamber of Commerce of Berlin, is said to have testified to the rejuvenating powers of this corn-starch mixture.

THE ADVERTISING AGENCY ANGLE

In the background is the advertising agency of Kling-Gibson Company, which readers of this department of THE JOURNAL have heard of before. This is the concern that was involved in the S. J. Eagan quackery, which the Federal Trade Commission exposed. The commission recorded that Leroy A. Kling—president of Kling-Gibson Company—and some of the other men connected with the company operated this medical fake while Kling-Gibson Company handled the advertising. It was the Kling-Gibson Company and one of its high-priced copywriters that the Federal Trade Commission declared, a year or two back, were responsible for the misleading advertisement of a quack, one Hobart Bradstreet. One Bradstreet advertisement prepared by the Kling-Gibson concern showed what purported to be the wonderful rejuvenating effect of Bradstreet's "course," as demonstrated in a white-haired, dignified bridegroom of advanced age, against whose shoulder leaned a youthful bride. The bridegroom was described as "Colonel Bemis" and his young bride was quoted as saying that, while the Colonel might look his age, he didn't act it "if his enthusiasm is any indication." The Federal Trade Commission brought out the fact that both the "Colonel" and the "bride" were professional photographers' models, who had never heard of Bradstreet, and that the story evolved by the Kling-Gibson copywriter was a tissue of falsehoods.

Kling-Gibson also handle such quack copy as "Marmola." This product, our readers will remember, is at present before the Federal Trade Commission and it has not yet been decided by the commission whether this dangerous thyroid-containing "obesity cure" shall or shall not be eliminated from trade channels. In the meantime the Kling-Gibson Company claims to have received a confidential report on the "Findings of Fact" made by the Examiner for the Federal Trade Commission, although it is understood that such findings of fact are supposed to be available only to the respondents or their attorneys. Whether this means that the Kling-Gibson Company

is also financially interested in the Marmola fake, aside from the money it makes by placing the advertising, is a question.

The chairman of the board of directors of the Lesser Company is Leroy A. Kling. Other stockholders whose address is the same as that of the Kling-Gibson agency are Felix Lesser (if there is such a person), George C. McDonald, Carl E. Widney (secretary of Kling-Gibson Company), Andrew Coburn, Lawrence L. Smith, L. M. Williams (said to be "contact man" for Kling-Gibson) and Arthur F. Marquette.

THE NEWSPAPERS' RESPONSIBILITY

So much for the background of personnel. Some respectable newspapers seem willing to share the profits of quackery with such concerns as the Lesser Company and the Kling-Gibson agency! The Chicago *Tribune*, which in the past has done yeoman work in fighting quackery, has carried full-page advertisements, both ordinary and photogravure, of this nostrum. On the other hand, it is only fair to say that, in its editorial pages, the *Tribune* is more considerate of its readers' confidence. A puzzled layman brought these facts to THE JOURNAL: A woman living a few miles out of Chicago wrote to Dr. W. A. Evans, the health editor of the *Tribune*, who conducts one of the sanest and most conservative health columns in the country. The woman put three questions to Dr. Evans:

> "(1) I would like to know if you can inform me as to the composition of Lesser's Slim Bath, recently advertised in the Chicago *Tribune*.
> "(2) Is it harmful?
> "(3) Do you recommend it for an obese to use?"

Dr. Evans very properly answered these three questions as follows:

> "(1) I do not know.
> "(2) I do not know. I know of no substance which can be used in bathwater and really reduce weight.
> "(3) No."

In view of this, it would seem that a little better coordination between the advertising and editorial departments would be in the interest of the *Tribune* readers.

THE MEDICAL EXPERT

How does it come that some reputable newspapers will accept such advertising as the Lesser Slim Figure Bath? One explanation is the fact that quacks can get supposedly reputable physicians to boost their products. The Lesser outfit is no exception. Kling-Gibson, in its attempt to get newspapers to carry the Slim Figure quackery, used letters, purported to have been written by Dr. Harold S. Hulbert of Chicago to L. M. Williams, the "contact man" of Kling-Gibson and one of those listed as a stockholder in the Slim Figure Bath fakery. According to these letters, Dr. Hulbert claims to have carried out a two weeks' test with certain patients. Incidentally, these alleged experiments are said to have been conducted in a Chicago hospital, which indicates that hospitals, as well as physicians, can be used as an asset to quackery. Dr. Hulbert in his letters describes the Slim Figure quackery as "a modified Nauheim bath (alkaline effervescent bath with cornstarch, salt and borax)." Needless to say, the report is favorable to the "treatment." A study of the Hulbert report shows that not a word is said about the food intake of the people that are alleged to have submitted to the tests. The closing paragraphs in Dr. Hulbert's first letter to Contact-man Williams are worth quoting in their entirety:

> "This bit of research [?] on this modification on Nauheim bath formula was done scientifically and without regard to expense. [!!!] The total expenses are approximately $1,250.00. [The exclamation and interrogation marks are ours.—ED.].
>
> "You may not use this letter nor any part of it for any advertising of this form of modification of Nauheim Baths. You may use this letter to assure yourself and others with whom you are in business association but not to customers or jobbers or buyers as to its effect in three ways: 1, that it is a simple remedy moderately effective; 2, that it was not observed to harm, and 3, that the patient did not suffer by this form of treatment. In acknowledging receipt of this letter, I request that you make a specific acknowledgment of agreement to these restrictions I have just stated."

Just why a physician who is willing to undertake a job of this sort—"without regard to expense"—should be unwilling to let the report of his test be made public, we leave for Dr. Hulbert to explain. It would appear, anyway, that the restrictions placed by the doctor on the use of his report were meant in a Pickwickian sense, for the report has been used as a leverage to get newspapers to accept the advertising of this piece of quackery. Before leaving the case of Dr. Hulbert, it is worth reminding the profession that he appeared recently as an "expert" for quack Hayes, exploiter of Marmola (advertising handled by Kling-Gibson Company).

THE PRODUCT

Now as to the product itself: The company emphasizes that the Lesser Slim Figure Bath "is not a salt" and, like every fake obesity cure on the market, is sold under the claim that, when used, it is unnecessary to diet or exercise. In addition to reducing one's weight Lesser Slim Figure Bath will do many other wonderful things. Thus:

> "As you dry yourself after the bath, you are thrilled with the suppleness, the youthful texture of your skin. It is velvety as a child's. After continuing with the baths for a short time, you notice a marked improvement in your complexion. Blackheads, pimples and blemishes disappear. Your skin takes on a vibrant, healthy texture, thru which the glow of health radiates. Your whole body tingles with vitality. You will find LESSER the most exquisite beauty bath you ever used."

Lesser Slim Figure Bath comes in the form of a package of white, highly scented effervescing powder in which there is a large compressed tablet that also slowly effervesces. The instructions are to fill the bath tub with hot water, empty the contents of the package into the tub and stir well, get into the tub and place the tablet "under your back." As the Lesser quacks say: "It is the chemical combination of this active tablet with the powder that produces the results desired." The "stylish-stout" is to remain in the tub fifteen minutes, while the tablet slowly sends bubbles up the spine, and keep the temperature constant by running in more hot water as the tub cools off. Three baths a week are said to be sufficient; "more than that will reduce you too rapidly." What is this marvel? The chemists of the American Medical Association were asked to answer this question. Here is their report:

LABORATORY REPORT

"Original packages of 'LESSER—The Slim Figure Bath' (Lesser Company, Inc., 310 S. Michigan Avenue, Chicago, U. S. A.) were examined by the A. M. A. Chemical Laboratory. Each package contained 228 Gm. (approximately 8 ounces) of a fine, white, highly scented powder, only partially soluble in water, with evolution of gas bubbles. The reaction to litmus was slightly alkaline. A large white compressed tablet and a circular were also enclosed. No information concerning the composition of Lesser appeared on the trade package or in the circular accompanying the package, except the statement, 'Guaranteed Harmless, Not a Salt.'

"The Powder."—Qualitative tests indicated the presence of sodium, boron, starch, carbonates and a substance resembling tartaric acid. Boron was present, probably as sodium tetraborate (borax), and the carbonate was present mainly as sodium bicarbonate. Under the microscope the starch grains appeared to be those derived from maize (Indian corn; grain of *Zea mays*). Alkaloids, heavy metals, phosphates, magnesium sulphate and sodium chloride were not found. The 'sulphated' ash was found to be 13.1 per cent. Quantitative determinations yielded the following:

Loss at 100 C	16.26	per cent
Starch	67.21	per cent
Bicarbonate and carbonate (as carbon dioxide, CO_2)	5.26	per cent
Boric anhydride (B_2O_3)[1]	4.93	per cent

"This may be calculated to:

Starch	67.2	per cent
Sodium bicarbonate ($NaHCO_3$)	10.0	per cent
Sodium tetraborate ($Na_2B_4O_7.10H_2O$)	13.5	per cent
Moisture and tartaric acid (by difference)	10.3	per cent

"A product having essentially the same properties may be prepared by using:

Cornstarch	7 parts
Borax ($Na_2B_4O_7.10H_2O$)	1 part
Baking soda ($NaHCO_3$)	1 part
Tartaric acid ($H_2C_4H_4O_6$)	1 part
Strongly odoriferous perfume.	

"The Tablet."—The accompanying white compressed tablet in each package weighed, on the average, 12 gm. each (approximately 185 grains); they slowly effervesced in water. Quali-

1. The figures for B_2O_3 and CO_2 yield somewhat higher theoretical value for sodium borate ($Na_2B_4O_7.10H_2O$) and sodium bicarbonate, respectively, than are actually present; this is to be expected as the composition of both borax and baking soda varies.

tative tests indicated the presence of sodium, a trace of magnesium, an acid-insoluble substance (microscopically resembling talc), carbonates, chlorides, tartrates and a trace of sulphates. The 'sulphated' ash was found to be 82.9 per cent. Quantitative determinations yielded the following:

Loss at 100 C	3.53	per cent
Acid-insoluble material (essentially talc)	3.4	per cent
Bicarbonates and carbonate (as carbon dioxide, CO_2)	4.04	per cent
Chlorides (Cl^-)	29.5	per cent
Magnesium (Mg^{++})	0.18	per cent
Sulphate (SO_4^{--})	0.33	per cent

"This may be calculated to:

Moisture	3.5	per cent
Talc	3.4	per cent
Sodium chloride	48.6	per cent
Sodium bicarbonate	7.8	per cent
Magnesium sulphate	0.5	per cent
Tartaric acid (by difference)	26.2	per cent

"A tablet having essentially the same composition may be prepared by using:

Baking soda	1 part
Table salt	6 parts
Tartaric acid	3 parts
Talc, as binder."	

Why stay poor when, by false and misleading advertising, it is possible to get the public to pay $1 for a few cents worth of cornstarch, borax, baking soda, tartaric acid and common salt? The fat are led to believe that, by sitting in a bath tub of hot water in which this mixture has been dissolved, they can reduce their weight (without diet or exercise), make their skin supple and youthful, remove blackheads, pimples and blemishes, and cause their whole bodies to tingle with vitality! And back of this preposterous nostrum we have highly respected business men, advertising men who dabble in quackery as a side-line, to say nothing of the "report" of a physician who, within the past few months, has appeared as a "medical expert" for another quack concern. And reputable newspapers are not above sharing the profits and furnish the contact between quack and victim!

Every physician knows—and one would suppose that in this year of grace the bulk of intelligent laymen would know—that this absurd mixture of cornstarch, borax, baking soda, etc., can have not the slightest effect in the reduction of weight. Sitting in a hot tub will, doubtless, cause a person to lose a small amount of weight, by the excretion of sweat and possibly by a mild increase in the rate of metabolism, but those who are deceived by the enticing—and suggestive—advertising of the Lesser Slim Figure Bath could get exactly the same results from using the ordinary bath tub and plain hot hydrant water!

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

POSSIBLE CAUSES OF HIGH BLOOD PRESSURE IN ADOLESCENCE

To the Editor:—A well developed, healthy appearing girl of 15 was found to have a blood pressure of 170 systolic and 115 diastolic when seated, and systolic 162 and diastolic 110 when reclining. The heart is slightly enlarged and a blowing systolic murmur is heard over the third and fourth interspaces to the left of the sternum, transmitted to the axilla and the angle of the scapula after exercise. Otherwise the examination is negative, except for slight enlargement of the thyroid and hypertrophied, cryptic tonsils. The urine is normal. The only complaint is a slight nervousness. The past history is negative, except for measles, pertussis and chickenpox when about 5 years of age. The patient's mother, aged 34, has a blood pressure of 250 systolic and 126 diastolic. Her mother's father died of cardiorenal disease. What are the possible causes of such a high blood pressure in a girl so young, and what treatment and advice would be indicated? Please omit name.

M.D., Minnesota.

ANSWER.—The possible causes of this high blood pressure are: (1) a primary cardiovascular degenerative disease, (2) hyperthyroidism or (3) syphilis. With a family history of three generations, the chances are that the girl was born with this tendency to cardiovascular degeneration. There have been numerous papers written on this subject which would of course include the kidney. Wassermann and basal metabolism tests should be done to exclude the other two possibilities. At best the treatment is not very satisfactory. General hygiene in regard to exercise, food and the usual activities implies moderation in all things and may keep such a patient in an optimal state. There are no drugs or specific treatment available. In certain instances the condition remains stationary and even improves, but the chances are for a progressively downhill course.

BLEBS AND BULLAE IN DIABETES

To the Editor:—What is the complication of diabetes mellitus that produces blebs and bullae of the fingers, with late hemorrhage therein? What is the treatment, if any?

DAVID A. BRYCE, M.D., Noroton Heights, Conn.

ANSWER.—This complication is seen more frequently on the toes than the fingers. Usually it precedes superficial gangrene. The treatment is general: desugarization, rest and cleanliness.

TREATMENT OF HOOKWORM IN CHILDREN

To the Editor:—In the treatment of hookworm, the dose of carbon tetrachloride is two parts and of oil of chenopodoium one part, as recommended by Smillie and Pessoa. Please advise me how to figure the dose of the mixture for school children.

W. W. KLEIN, M.D., Horton, Ala.

ANSWER.—The mixture may be given in doses of 0.2 cc. (3 minims) for each year of life up to the age of 15, when the adult dose of 3 cc. is reached; this should not be exceeded.

DEFICIENT ACTIVITY OF OVARIAN FUNCTION

To the Editor:—A girl, aged 26, of medium build, has suffered from amenorrhea for the last seventeen months. She started to menstruate at the age of 12 and menstruated regularly every four weeks, from three to four days, up to September, 1925, when menstruation stopped suddenly. She was given from twelve to eighteen injections of some ovarian preparations and eighteen injections of sodium cacodylate, without result. In May, 1926, the patient menstruated again, but in June of the same year, when an appendectomy was performed, she did not menstruate; then, on July 9, menstruation reappeared, only to stop for exactly a year, until July 9, 1927. Since this date she has not menstruated. June 8, 1926, she was examined by a gynecologist who did not find any gynecologic pathologic changes and believed the amenorrhea to be a "hypo-ovarian function." In March, 1927, another gynecologist examined her and found "hypoplasia of the inner genitalia." I failed to detect any pathologic changes, except a very mild degree of anemia. At times the patient has a sensation of fulness in the nose without bleeding and occasional swelling of the breasts. Kindly give your opinion regarding this case and also suggest treatment. Would it be advisable to use "Menformon?" Should or should not marriage be advised? The patient has normal sexual inclinations toward the opposite sex. Please omit name.

M.D., New York.

ANSWER.—This is a case of hypofunction of the gonads which may be primary or secondary. It is advisable to perform the R. T. Frank test for the presence of sex hormone in the blood. The test should be repeated frequently to see whether or not there is a definite cycle. If a distinct cycle in the amount of sex hormone is present, the outlook is much more hopeful than otherwise. It may then be advisable to try small doses of roentgen rays but this should be administered only by a competent roentgenologist working with a gynecologist. An ovarian hormone preparation may be injected into the patient but the results are still uncertain. Commercial sex hormone preparations have thus far failed to produce any beneficial effects except perhaps in isolated instances. The same is true of desiccated ovarian gland preparations. The patient should be permitted to marry if she has normal sex inclinations toward the male, especially if she wants to marry. The hyperemia resulting from more or less regular coital relationship may help to stimulate the activity of the ovaries and the uterus. The anemia should be treated and general supportive measures should be carried out.

TIME REQUIRED FOR DESTRUCTION OF BODY

To the Editor:—How long must a body be exposed in the open air to be reduced to a bony skeleton? A skeleton was discovered in this vicinity. The clothing was well preserved but all the fleshy parts of the body had disintegrated. A question has arisen as to when death occurred. Could it have occurred a few months ago, even though the body was exposed to the elements during the hot season?

M. V. BALL, M.D., Warren, Pa.

ANSWER.—Moisture, light, temperature, exposure to necrophagous animals, the amount of adipose tissue and the cause of death profoundly influence the time required for the soft tissues to disappear. Another factor is altitude. It is well known

that, protected from flies and insects, meat will remain fit to eat for a long time when hung in the open at high altitudes. An excellent account of these matters is by James Ewing in Legal Medicine and Toxicology, edited by Peterson, Haines and Webster, Vol. 1, p. 200, 1923. Another is in Hofmann's Lehrbuch der gerichtlichen Medizin, ed. 11, edited by Haberda, p. 1045, 1927, in which there are many references to the literature.

TREATMENT OF THE LEUKEMIAS

To the Editor:—What is new in the treatment of the leukemias? Can you suggest anything other than roentgen rays and benzene?

LEO MORTON SCHULMAN, M.D., Hollywood, Calif.

ANSWER.—There is nothing new in the treatment of the leukemias that is more reliable than irradiation with roentgen rays or radium. Benzene is still used to some extent.

TREATMENT OF ABSENCE OF TESTICLES

To the Editor:—What can be done for a 15 year old boy who has no testicles, not even a vestige, and all the consequent characteristics? Would the administration of a testicular extract or a preparation of the interstitial cells of Leydig do any good? Please omit name.

M.D., Nebraska.

ANSWER.—A true absence of both testicles is a rather rare anomaly and is always combined with rudimentary development of the external genitalia and lack of other characteristics of the male type. In the absence of such deficiencies, the attempt is indicated to open the inguinal canals and search for the testicles retained somewhere within the abdominal cavity. If located, they are brought down into the scrotum after one of the approved methods employed in such instances. Organotherapy either in absence of the testicles or in misplacement must be considered of doubtful value.

CHOREA

To the Editor:—I have as a patient a boy, aged 11 years, who is now having his second recurrence of chorea. With the two previous attacks he responded to the usual treatment, viz., bromides, rest, increasing doses of solution of potassium arsenite, and the removal of badly infected tonsils. The third attack does not seem to clear up under treatment. The boy's father suffered from the same condition at about the same age and was given a proprietary remedy with rapid and complete cessation of symptoms. Have you any suggestions?

RUSSELL C. SEIPEL, M.D., Philadelphia.

ANSWER.—Recurrences in Sydenham's chorea are not uncommon. It is doubtful whether any remedy has a specific action and the disease tends to self-limitation, the average duration being about three months. Sometimes the choreic movements will continue much longer but the patient eventually recovers.

EFFECTS OF SULPHUR DIOXIDE—ECZEMA IN INFANTS ON SYRUP FEEDING

To the Editor:—I have been using Karo Syrup in some of my infant feedings and I have had a few cases of eczema which, I believe, may be due to this carbohydrate. Karo Syrup is advertised as containing 1 per cent of extractives. I have since had a chemist analyze this product, and he reported that the extractive was sulphur dioxide. 1. Is sulphur dioxide harmful? 2. Have there ever been any cases of poisoning by sulphur dioxide? 3. Has sulphur dioxide ever been used as a preservative for foods? 4. Is sulphur dioxide prohibited by the United States government as a preservative? 5. Will you have this product analyzed as to its constituents? Kindly omit name.

M.D., New York.

ANSWER.—Questions 1 to 4 must be answered in the affirmative. This does not mean, however, that "Karo Syrup" is responsible for the cases of eczema observed. McKim Marriott, for instance, who has been using Karo Syrup in infant feeding for the last ten years has "had no reason to believe that it is responsible for the production of this condition. Cases of eczema are no more frequent in babies fed on Korn Syrup than in those fed on other sugars" and he knows "of no instance where the condition, if present, has been improved by changing to other forms of carbohydrate."

5. It is undoubtedly an error to interpret the 1 per cent "extractives" listed in the composition of Karo Syrup (Blue Label) as sulphur dioxide. According to the advertising literature, Blue Label Karo, which may be considered a brand of glucose, U. S. P., contains a small quantity of refiners' syrup, and this introduces a certain amount of sucrose and invert sugar, and small quantities of protein. The total amount of sulphur dioxide contained in Karo Syrup is well within the tolerance permitted by the Food and Drugs Act, about 30 parts per million. This amount does not serve as a preservative, the keeping qualities of the syrup being dependent on the concentration of the sugar solution. One cannot conceive of eczema being caused by so minute an amount of sulphur dioxide ingested by the use of this food.

MARRIAGE WITH MENTAL DEFECT IN FAMILY

To the Editor:—Recently a young man consulted me about marrying a girl (aged 20) whose mother has been confined to an asylum for the past fifteen years with dementia praecox. The mother of this girl gave birth to four children, three of whom are still living; the fourth and last child was stillborn at eight months. This delivery was difficult and was followed by a severe postpartum hemorrhage. The attending physician used ice packs in order to stop the hemorrhage. After recovering, the patient began to show signs of mental deterioration, which gradually became worse, and she was finally placed in an asylum. The three living children (aged 32, 23 and 20) are apparently of normal mentality. There is no history of any other insanity in the family on either side. There has not been found any organic cause for the mother's insanity; i. e., tuberculosis or syphilis. The young man comes from good stock, with no history of insanity. Would it be advisable for this young man to marry under these circumstances? Please omit name.

M.D., Illinois.

ANSWER.—It is generally believed that heredity is a major factor in the causation of dementia praecox, and it is suggested that this factor is of a recessive mendelian type. If this is true, it is obvious that it would be possible for the disease to skip one generation and reappear in the offspring of an apparently healthy person. Nevertheless, studies, especially those of Rüdin, seem to point to the conclusion that some pathologic element is present in the germ plasm of both parents when dementia praecox develops. If there is no taint on the side of the man in question there would, under this hypothesis, apparently be no danger in the mating. Knowledge of the facts of inheritance in this disease, however, is too incomplete to permit any absolute assurance and it would be wiser to have both parties studied psychiatrically. Pronounced evidences of schizoid traits in the woman, especially if there are similar traits in the man, or their absence would be better guides in reaching a decision than the mere statment that the mother of the girl is suffering from a chronic psychosis of dementia praecox type.

DONORS FOR BLOOD TRANSFUSION

To the Editor:—Is it possible for you to tell us what method other hospitals use in obtaining a list of donors for blood transfusions? We should like to have a list of this kind on hand, but do not know just what plan to use in obtaining donors for these transfusions.

YORK HOSPITAL, York, Pa.

ANSWER.—When one of the large hospitals in Chicago is in need of donors it places an advertisement in one of the daily newspapers, asking donors to report to the hospital at a certain hour. All these applicants are grouped according to the method of Moss, and blood is taken for a Wassermann test, each applicant being questioned as to the existence of any infectious or chronic disease. All applicants whose blood Wassermann reaction is negative, and whose history is good, are placed on file so that they can be called by telephone when a donor is required.

LINGUA NIGRA OR BLACK TONGUE

To the Editor:—Is there any cure for lingua nigra? I have used both aromatic sulphuric acid and 20 per cent trichloracetic acid every two or three days, followed by curettement. Please omit name.

M.D., Spirit Lake, Iowa.

ANSWER.—The cause of black tongue is not known. Some cases have been attributed to monilia, others to pneumococci. No organism has been definitely established as causing it. It is apparently of no significance and there is no reason for the patient to be anxious on account of its presence. The most important thing is to know the facts about it and to give them to the patient. Treatment is without effect. The innumerable treatments that have been suggested are all unsatisfactory.

LICHEN PLANUS BUCCALIS

To the Editor:—What is the treatment, if any, of lichen planus buccalis? What chance is there for a spontaneous cure? What food must the patient eat and what must he avoid? What mouth washes shall he use and what must he not? Please advise what to read on the subject. Please omit my name.

M.D., New York.

ANSWER.—Lichen planus buccalis responds to the same treatment that the disorder does when presenting its manifestations on the skin, as discussed in most textbooks of dermatology. It is rare that spontaneous recovery occurs. Stimulating, highly seasoned and hot foods should be avoided, together with acids such as orange juice, grape fruit and vinegar. Simple saline mouth washes are advisable.

MECHANISM OF ACTION OF DIAPHRAGM

To the Editor:—In THE JOURNAL, Dec. 15, 1928, p. 1894, you state that "in all acts of expulsion, sneezing, coughing, laughing, vomiting and crying, for example, the diaphragm adds power to expulsive effort." Kindly explain how the musculature of the diaphragm can contribute power to expiratory efforts? W. D. ZOETHOUT, Berwyn, Ill.

ANSWER.—On the basis of available evidence as to the physiology of the acts referred to, the statement is partly in error. The diaphragm can add power in these processes only by contraction of its muscular elements, and such contraction invariably pushes the diaphragm against the liver and farther into the abdominal cavity. There is good evidence, however, that the diaphragm contributes to the pressure on the stomach by active contractions in the expulsive act of vomiting. Vomiting is usually preceded by a series of retching acts. This retching is inspiratory, during the latter part of which the glottis is closed, but the diaphragm remains contracted (in an inspiratory contracted state) during the expulsive act of vomiting. This obviously renders the diaphragm tense and contributes to the pressure on the stomach exerted by the contraction of the abdominal muscles, which furnishes the main expulsive force in vomiting, at least in the adult person. Sneezing, coughing, laughing and crying are expiratory acts, cut short or modified by neuromuscular mechanisms controlling the glottis, the pharynx and the expiratory muscles themselves. There is at present no evidence that the diaphragm adds power to these processes of forcing air out of the lungs.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALASKA: Juneau, March 5, 1929. Sec., Dr. Harry C. DeVighne, Territorial Medical Examining Board, Juneau, Alaska.

CALIFORNIA—Reciprocity: San Francisco, March 13, 1929. Sec., Dr. Charles B. Pinkham, Board of Medical Examiners, 420 State Building, Sacramento, Calif.

CONNECTICUT—Homeopathic: New Haven, March 12, 1929. Sec., Dr. Edwin C. M. Hall, Homeo. Medical Examining Board, New Haven, Conn.

KANSAS: Topeka, Feb. 12, 1929. Sec., Dr. A. S. Ross, Board of Medical Registration and Examinations, Sabetha, Kan.

MAINE: Portland, March 12-13, 1929. Sec., Dr. Adam P. Leighton, Board of Registration of Medicine, 192 State House, Portland, Me.

MASSACHUSETTS: Boston, March 12-14, 1929. Sec., Dr. Frank M. Vaughan, Board of Registration in Medicine, 144 State House, Boston, Mass.

NATIONAL BOARD, Parts 1 and 2: All class A medical schools, Feb. 13-15, 1929. Sec., Mr. Everett S. Elwood, 225 South Fifteenth St., Philadelphia.

NEBRASKA: Omaha, Feb. 13-15, 1929. Dir., Mrs. Clark Perkins, Dept. of Public Welfare, Bureau of Examining Boards, Lincoln, Neb.

NEW HAMPSHIRE: Concord, March 14-15, 1929. Sec., Dr. Charles Duncan, State Medical Board, State House, Concord, N. H.

OKLAHOMA: Shawnee, March 12-13, 1929. Sec., Dr. J. M. Byrum, Board of Medical Examiners, Shawnee, Okla.

PHILIPPINE ISLANDS: Manila, March 5, 1929. Sec., Dr. Jose V. Gloria, Board of Medical Examiners, 341 Ronquilla Sta., Cruz, Manila, Philippine Islands.

PORTO RICO: San Juan, March 5, 1929. Sec., Dr. Diego A. Biascoechea, Board of Medical Examiners, 3 Allen Street, San Juan, Porto Rico.

VERMONT: Burlington, Feb. 12, 1929. Sec., Dr. W. Scott Nay, Underhill, Vt.

Wisconsin September Examination

Dr. Robert E. Flynn, secretary of the Wisconsin Board of Medical Examiners, reports the written examination held at Milwaukee, Sept. 13, 1928. The examination covered one subject and included five questions. An average of 75 per cent was required to pass. Eleven candidates, including two osteopaths, were examined and passed. Twelve physicians, including one osteopath, were licensed through reciprocity with other states. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Illinois College of Medicine		(1928)	90
Harvard University Medical School		(1922) 85.3, (1926)	85
Boston University School of Medicine		(1927)	90
University of Wisconsin Medical School		(1927) 85, 85,	95
Marquette University School of Medicine		(1928)	80, 84
Osteopaths		(1928)	78, 82

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Georgia Medical Department		(1923)	Georgia
Northwestern Univ. Med. School		(1923) New York, (1927)	Illinois
University of Illinois College of Medicine		(1905)	Illinois
Indiana University School of Medicine		(1926) (2)	Indiana
State University of Iowa College of Medicine		(1926)	Iowa
University of Minnesota Medical School		(1923)	Minnesota
Barnes Medical College, St. Louis		(1893)	Indiana
University of Pennsylvania School of Medicine		(1926)	California
Marquette University School of Medicine		(1928)	Illinois
Osteopath			Washington

Minnesota October Examination

Dr. A. E. Comstock, secretary of the Minnesota State Board of Medical Examiners, reports the oral, written and practical examination held at Minneapolis, Oct. 16-18, 1928. The examination covered 11 subjects and included 60 written questions. An average of 75 per cent was required to pass. Twenty-five candidates were examined and passed. Ten physicians were licensed by reciprocity with other states and one by endorsement of credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine		(1926)	88
Georgetown University School of Medicine		(1922)	90
Northwestern University Medical School		(1927) 88, (1928)	92
University of Illinois College of Medicine		(1928)	91
State University of Iowa College of Med.		(1927) 88, (1928)	88, 90
Tulane University of Louisiana School of Medicine		(1922)	86
Johns Hopkins University School of Medicine		(1924)	92
University of Michigan Medical College		(1926)	84, 86
University of Minnesota Medical School		(1925) 88, (1927) (1928) 88,* 89,* 91,* 92*	91,*
University of Nebraska College of Medicine		(1925)	92
University of Pennsylvania School of Medicine		(1924)	89
University of Virginia Department of Medicine		(1926)	90
University of Manitoba Faculty of Medicine		(1923)	92
Dalhousie University Faculty of Medicine		(1926)	90
University of Western Ontario Medical School		(1926)	90
McGill University Faculty of Medicine		(1924)	91

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Colorado School of Medicine		(1927)	Colorado
Rush Medical College		(1921)	Montana
Northwestern University Medical School		(1925)	Illinois
University of Illinois College of Medicine		(1920) (1926)	Illinois South Dakota
State University of Iowa College of Medicine		(1927)	Iowa
St. Louis University School of Medicine		(1925)	Missouri
Ohio State University College of Medicine		(1924)	Ohio
Marquette University School of Medicine		(1928)	Wisconsin
University of Manitoba Faculty of Medicine		(1925)	Illinois

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement with
Washington University School of Medicine		(1926)	N. B. M. Ex

* These candidates have received their M.B. degrees and will receive their M.D. degrees on completion of one year's internship in a hospital.

Texas June Examination

Dr. T. J. Crowe, secretary of the Texas State Board of Medical Examiners, reports the written examination held at Austin, June 19-21, 1928. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. One hundred and twenty-six candidates, including six osteopaths, were examined, 122, including three osteopaths, passing and four, including three osteopaths, failing. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1926)	88.3
Tulane University of Louisiana School of Med.		(1928) 87, 87.7,	88.4
Washington University School of Medicine		(1927)	84.1
St. Louis University School of Medicine		(1927) 85.3,	86.7
University of Oklahoma School of Medicine		(1928)	88.1
Jefferson Medical College of Philadelphia		(1927)	82.5
University of Pittsburgh School of Medicine		(1927)	82.3
Vanderbilt University School of Medicine		(1927)	86.0
University of Tennessee College of Medicine		(1928)	82.9
Meharry Medical College		(1928) 78.6,	78.8
University of Texas School of Medicine		(1928) 81.1,	81.3, 82.4, 83.3, 84, 84.3, 84.6, 84.8, 84.9, 85, 85.8, 86, 86.3, 86.3, 86.5, 86.8, 86.8, 86.8, 87, 87.1, 87.3, 87.5, 87.6, 87.9, 88, 88, 88.2, 88.5, 88.9, 89.1, 89.1, 89.2, 89.3, 89.4, 89.5, 90, 90, 90.3, 90.5, 90.5, 90.7, 92.5
Baylor University College of Med.		(1928) 78, 78.8, 79.3, 80.9,	81.1, 81.6, 81.7, 81.9, 82, 82.3, 82.4, 82.5, 82.6, 82.8, 83.1, 83.1, 83.5, 83.9, 84, 84, 84.4, 84.7, 84.7, 84.8, 84.9, 85, 85, 85, 85, 85.2, 85.4, 85.7, 85.8, 85.8, 85.9, 86, 86.1, 86.1, 86.1, 86.3, 86.4, 86.5, 86.5, 86.6, 86.6, 86.8, 87, 87.1, 87.4, 87.5, 87.5, 88.3, 88.8, 89.1, 90, 91
University of Modena, Italy		(1921)	82.0
University of Palermo, Italy		(1922)*	80.0
Literary and Scientific Institute, School of Medicine of San Luis Potosi, Mexico		(1911)* 75.0, (1928)*	81.1
Free School of Homeopathy, Mexico		(1916)* 75, (1925)*	79.3
School of Medicine, Oaxaca, Mexico		(1911)*	82.2
Osteopaths		(1928) 85.4, 86.8,	89.8
	FAILED		
National University, Athens		(1913)*	†
Osteopaths		(1925) 34, (1928) 63.4,	71.2

* Verification of graduation in process.
† No grade given.

Book Notices

BLOOD AND URINE CHEMISTRY. By R. B. H. Gradwohl, M.D., Director of the Gradwohl Laboratories, St. Louis, and Ida E. Gradwohl, A.B., Instructor in the Gradwohl School of Laboratory Technic, St. Louis. Cloth. Price, $10. Pp. 542, with 121 illustrations. St. Louis: C. V. Mosby Company, 1928.

This work appears to be an enlargement of a former one by Gradwohl and Blaivas, and is intended to be a textbook for laboratory workers and practitioners of medicine. As the authors state in the preface, "Blood chemical methods have come into their own in so far as clinicians are concerned. There is hardly a specialty in medicine in which these methods are not of importance in summing up the individual's disability. The methods touch upon the integrity of kidney and liver function, upon internal glandular secretory activity, upon operative risk, upon all that goes with metabolic function and dysfunction." The book is divided into four parts: part I, technic of blood chemistry, comprising sixteen chapters; part II, chemistry of urine, four chapters; part III, the interpretation of blood chemical observations, four chapters; part IV, basal metabolism, one chapter. The discussions of such general matters as equipment and installation of the blood chemical laboratory, apparatus needed for blood chemical examinations, description of various colorimeters, and the manner of procuring and handling specimens for examination are so detailed and so clearly presented that the worker need have little difficulty in establishing his own laboratory and familiarizing himself with the general principles involved in such work. The selection of methods for the various examinations is excellent and conservative; the technic of these methods is clearly and accurately presented, and the calculations involved are simply given. The section dealing with the interpretation of chemical observations of the blood is especially full, complete and instructive, references to the literature being freely given. The style of the subject matter is clear and pleasing; the illustrations are adequate, and the mechanical make-up of the book is satisfactory.

LECCIONES DE CARDIOLOGIA. Fasciculo I. Por Dr. J. Montes Pareja. Paper. Pp. 340, with illustrations. Montevideo, 1928.

These lectures are not clinical; they are didactic. They are altogether excellent. They deserve to be translated into English so as to reach a wider circle of readers. Each lecture is in reality a monograph. Some topic that is usually given a few sentences or paragraphs in the ordinary textbook article is here made the subject of a scholarly lecture. The author is familiar with the literature of cardiology. But, best of all, he knows how to use this literature and how to present in telling form the results of his exhaustive studies. He draws lessons also from personal clinical observation. To show the scope of the lectures, the first, the shortest of the four, deals with the cardiac hormone, or the humoral regulation of the heart beat. The second takes up functional heart murmurs. The third discusses the third heart sound, and also gallop rhythm. The last lecture considers modern surgical procedures in diseases of the heart—valvular disease, adhesive pericarditis and angina pectoris.

THE AMERICAN HOSPITAL OF THE TWENTIETH CENTURY. A Treatise on the Development of Medical Institutions, Both in Europe and in America, Since the Beginning of the Present Century. By Edward F. Stevens, Architect. Third edition. Cloth. Price, $15. Pp. 549, with 660 illustrations. New York: F. W. Dodge Corporation, 1928.

The author is a well known hospital architect and authority on hospitals who years ago decided to devote his entire career to the planning of medical institutions. The illustrations include interior and exterior veiews, orientation, details of planning, construction, installations, equipment, interior finish and color schemes, and the treatment of grounds and layouts. Among the twenty-two chapters are those on the administrative department; the service building—kitchen and laundry; heating, ventilation and plumbing; details of construction and finish; equipment, and landscape architecture. Both the illustrations and the subject matter have been brought down to date including the majority, if not all, of the approved recent ideas in hospital planning, construction and equipment. There is a chapter on each of the following departments: surgical, physical therapy, maternity, children's, communicable diseases, psychopathic and tuberculosis. In response to the demands of today, the author has included considerable discussion and information on such subjects as the small hospital, the medical school hospital, the nurses' residence and the research department. The book is a source of information and suggestions for prospective builders of hospitals, and every prospective builder would do well to read the book before determining on plans.

THE CLINICAL EXAMINATION OF THE NERVOUS SYSTEM. By G. H. Monrad-Krohn, M.D., F.R.C.P., Professor of Medicine in the Royal Frederick University, Oslo. With a foreword by T. Grainger Stewart, M.D., F.R.C.P., Physician to the National Hospital for the Paralyzed and Epileptic, Queen Square. Fourth Edition. Cloth. Price, $2.50 net. Pp. 209, with 55 illustrations. New York: Paul B. Hoeber, Inc., 1928.

The first edition of this skilfully condensed book appeared in 1921. The review of it in the *Archives of Neurology and Psychiatry* in November of that year stated that it contained an astonishing amount of information; that the field was exceedingly well covered, and that the thoroughness of the work, in view of its size, was surprising. The review concluded by saying that if a few thousand practitioners and a few hundred neurologists would commit its contents to memory "the American neurological level would rise like the Wissahickon in a spring freshet." All of this is still more true of the present slightly enlarged edition. Its great merit is that it gives in a clear way everything essential about methods of examination and nothing more. Even the Bárány vestibular tests, the Binet-Simon tests and methods of electrical examination are made easy of understanding. This book has been recommended to students for many years and has been found most satisfactory.

THE HISTORY OF BIOLOGY: A SURVEY. By Erik Nordenskiöld. Translated from the Swedish by Leonard Bucknall Eyre. Cloth. Price, $6. Pp. 646, with 32 portraits. New York: Alfred A. Knopf, 1928.

This represents a series of lectures given at the University of Helsingfors, tracing the relationships of the study of life to the cultural aspects of civilization in general. The work is divided into three parts, according to chronological divisions, and includes excellent descriptions of the beginning of modern medicine. As is necessary in all history, movements of thought and of action are related to the lives of great leaders. These are brought into the history of biology largely, however, in relationship to their accomplishments rather than by means of simple biographic statements. The book has value as a reference work, since it is supplemented by a fine bibliography and an excellent index. It is a good reference for students, but, because of its comprehensive character, a rather difficult work for general reading. The type, which is small and somewhat too compact, with a wide column on the page, makes continuous reading rather difficult for ordinary vision.

NOVA TECHNICA PARA O CALCULO DA INFESTAÇÃO PELOS ANCYLOSTOMOS POR MEIO DA CONTAGEM DOS OVOS (ESTUDO EXPERIMENTAL). These de concurso apresentada á Faculdade de Medicina da Bahia para a docencia livre de medicina tropical. Por Hietor Praguer Fróes. Paper. Pp. 68. Bahia: A Nova Graphica, 1928.

This was originally a thesis presented to the medical faculty at Bahia for the licentia docendi in tropical medicine. It represents an extended experimental study of the methods employed in measuring infection with parasitic worms by estimating the number of eggs evacuated. As a result of his experiments the author proposes a method which is a refinement of the methods described by Fülleborn, Stoll and others:

> Of formed feces take 5 Gm. or, if pasty, 10 Gm., add a concentrated solution of NaCl (density not less than 1,200) at first drop by drop, rubbing carefully to produce a uniform mixture without lumps. After the liquid has stood forty to forty-five minutes, remove a surface sample by platinum loop equal in diameter to one tenth that of receptacle. Take one sample from the center and a second from the marginal zone. With power of 60 to 80 diameters count the eggs under a cover large enough to include the entire sample. Add the number of eggs on both slides and multiply by 10 to get the approximate number per gram of feces. Finally, multiply the figure just obtained by the number of grams of feces evacuated in twenty-four hours; this will give the quantity of eggs eliminated in the twenty-four hour period, or the density of the infestation.

An extended analysis of this and other methods, with calculations from actual cases, tables, and a bibliography, complete the work.

WHAT IS LIFE? By Augusta Gaskell. Introduction by Karl T. Compton, Professor of Physics, Princeton University, and by Raymond Pearl, Professor of Biology, the Johns Hopkins University. Cloth. Price, $3.50 net. Pp. 324. Springfield: Charles C. Thomas, 1928.

The question that has never been answered, and which perhaps never will be answered, does not find a solution in Mrs. Gaskell's contribution. It does, however, receive at her hands an exceedingly interesting discussion. She proposes an attempt to discover what it is that passes from the body at the time of death, with a belief that a measurement of this quantity will establish the difference between life and death. Her subject and the nature of her presentation have aroused the interest of the physicists and the biologists. The presentation of the volume by the new Thomas press is all that could be asked of modern publishing. It has a fine binding, beautiful type on an artistically arranged page, an introduction, a good glossary and an index.

SPASMOPHILIA. By Edward C. Wrightsman, M.D. Cloth. Price, $2. Pp. 155, with 23 illustrations. Boston: Richard G. Badger, 1928.

This book is not a commendable effort from the publisher's point of view; the covers are gaudy red, the paper is cheap, the grammar is atrocious and the form of the contents is such as to make the material inaccessible. There is no index. The author bases most of the clinical statements on his own case histories. The fundamental facts of metabolism and the basic studies of spasmophilia are lacking.

Books Received

Books received are acknowledged in this column, and such acknowledgment must be regarded as a sufficient return for the courtesy of the sender. Selections will be made for more extensive review in the interests of our readers and as space permits. Books listed in this department are not available for lending. Any information concerning them will be supplied on request.

ULTRA-VIOLET RADIATION AND ACTINOTHERAPY. By Eleanor H. Russell, M.D., B.S., Honorary Physician Sun-Ray Clinic, Newcastle-on-Tyne, and W. Kerr Russell, M.D., B.S., Medical Director Sun-Ray Clinic, Newcastle-on-Tyne. With forewords by Sir Oliver Lodge, F.R.S., D.Sc., LL.D., and Sydney Walton, C.B.E., M.A., B.Litt. Third edition. Cloth. Price, $6.50. Pp. 648, with 259 illustrations. New York: William Wood & Company, 1928.

New edition offering valuable information and as usual optimistic suggestions for therapy.

ACUTE INFECTIOUS DISEASES. By Jay Frank Schamberg, A.B., M.D., Professor of Dermatology and Syphilology in the Graduate School of Medicine, University of Pennsylvania, and John A. Kolmer, M.Sc., M.D., Dr.P.H., Professor of Pathology and Bacteriology in the Graduate School of Medicine of the University of Pennsylvania. Second edition. Cloth. Price, $10 net. Pp. 888, with 188 illustrations. Philadelphia: Lea & Febiger, 1928.

New edition dealing with modern studies of the infectious diseases.

DIABETIC SURGERY. By Leland S. McKittrick, M.D., F.A.C.S., Visiting Surgeon, Palmer Memorial Hospital, and Howard F. Root, M.D., Assistant Physician, New England Deaconess Hospital. With a foreword by Daniel F. Jones, M.D., and Elliott P. Joslin, M.D. Cloth. Price, $4.25 net. Pp. 269, with 81 illustrations. Philadelphia: Lea & Febiger, 1928.

Monographic consideration on a special surgical problem with new developments based on the use of insulin.

NOUVEAU TRAITÉ DE MÉDECINE. Par G. H. Roger, Fernand Widal, et P. J. Teissier. Fascicule XVI: Pathologie du foie et des voies biliaires. Sémiologie: physique (Maurice Villaret, et L. Justin-Besançon); fonctionelle (Marcel Garnier). Syndromes: insuffisance et suractivité fonctionelles (M. Garnier), etc., etc. Boards. Price, 125 francs. Pp. 1048, with illustrations. Paris: Masson & Cie, 1928.

Part of a French system of medicine, this one dealing with the biliary tracts.

RESEARCHES IN POLYNESIA AND MELANESIA. An Account of Investigations in Samoa, Tonga, the Ellice Group, and the New Hebrides, in 1924, 1925. Parts V-VII (Relating to Human Diseases and Welfare). By Patrick A. Buxton, M.R.C.S., D.T.M. & H., Director, Department of Medical Entomology, London School of Hygiene and Tropical Medicine. Cloth. Price, 9/-. Pp. 139, with illustrations. London: London School of Hygiene and Tropical Medicine, 1928.

Monograph on problems of tropical medicine.

QUALITATIVE ANALYSIS FOR STUDENTS OF PHARMACY AND MEDICINE. By Charles B. Jordan, Ph.C., M.S., Dean of School of Pharmacy and Professor of Pharmaceutical Chemistry, Purdue University. Cloth. Price, $2.50. Pp. 169. New York: McGraw-Hill Book Company, Inc., 1928.

Brief textbook which will find it difficult to survive under university methods in medical education.

LA GRANULOMATOSE MALIGNE (LYMPHOGRANULOME). Étude anatomoclinique, étude thérapeutique spécialement du point de vue de la roentgenthérapie. Par Docteur Léon Babaiantz, assistant a l'Institut Central de Radiologie de l'Hôpital Cantonal de Genève. Paper. Pp. 176, with illustrations. Geneva: Payot & Cie, 1928.

The effects of roentgen-ray exposure of granulomas with case reports.

PUBLIC HEALTH AND HYGIENE. In Contributions by Eminent Authorities. Edited by William Hallock Park, M.D., Professor of Bacteriology and Hygiene, University and Bellevue Hospital Medical College. Second edition. Cloth. Price, $9 net. Pp. 902, with 123 illustrations. Philadelphia: Lea & Febiger, 1928.

New edition of a substantial and reliable textbook—the only equal competitor of Rosenau's opus.

EINFÜHRUNG IN DIE HÄMATOLOGIE, ZUGLEICH VIERTE AUFLAGE DES TASCHENBUCHES DER KLINISCHEN HÄMATOLOGIE. Von Dr. A. von Domarus, Direktor der Medizin. Abteilung des Städtischen Krankenhauses, Berlin-Weissensee. Fourth edition. Cloth. Price, 14 marks. Pp. 185, with 17 illustrations. Leipzig: Georg Thieme, 1929.

Modern investigation of the blood with handsome colored plates as guides.

DIAGNOSTIC ET THÉRAPEUTIQUE PAR LE LIPIODOL. Clinique et radiologie. Par J.-A. Sicard, professeur à la Faculté de médecine de Paris, et J. Forestier. Paper. Price, 50 francs. Pp. 370, with 49 illustrations. Paris: Masson & Cie, 1928.

A complete study of the use of lipiodol by pioneers in its investigation.

LE PH EN BIOLOGIE. Par les Docteurs Marcel Verain, chef de laboratoire à la Faculté de médecine, et Jean Chaumette, licencié ès-sciences physiques. Préface du Professeur E. Darmois. Paper. Price, 16 francs. Pp. 159, with 20 illustrations. Paris: Masson & Cie, 1928.

Small paper covered monograph on the importance of the acid-base relationship.

LE TRAITEMENT DES TEIGNES PAR L'ACÉTATE DE THALLIUM. Par le Docteur Jesus Gonzalez Urueña, professeur de clinique dermatologique à la Facultéde Médecine de Mexico. Paper. Price, 18 francs. Pp. 144, with 9 illustrations. Paris: Masson & Cie, 1928.

The use of thallium acetate for epilation in the treatment of parasitic inflammations of the scalp.

RÖNTGENOLOGY: The Borderlands of the Normal and Early Pathological in the Skiagram. By Alban Köhler, Prof. Dr. med., Wiesbaden. Translated from the fifth German edition by Arthur Turnbull, M.A., B.Sc., M.B. Cloth. Price, $14. Pp. 556, with 324 illustrations. New York: William Wood & Company, 1928.

Guide to development of roentgenology as a medical specialty.

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Medicolegal

Chronic Poisoning Due to Accident Compensable

(Seattle Can Co. v. Department of Labor and Industries of Washington et al. (Wash), 265 P. 739)

The case cited is one of three, based on claims submitted to the Department of Labor and Industries of Washington, growing out of the poisoning of three women by benzol in the course of their employment. The cases were rejected by the department on the theory that the poisoning was not due to any fortuitous event but was in the nature of an occupational disease and as such not compensable. On appeal, the superior court for King County reversed the department's ruling, and thereupon an appeal was taken to the supreme court of Washington. It appeared from the evidence that cans covered with a sealing compound containing benzol were in the course of the employer's business placed in ovens, from which, prior to 1924, the benzol fumes were carried off by ventilation. In 1924, an addition was made to the building, and without the knowledge of the employer proper provisions for ventilation were not made. Benzol fumes thereafter escaped from the oven and, in the course of three or four months, poisoned the claimants. The department in its appeal to the supreme court still contended that the conditions complained of were not due to a fortuitous event and could not be constituted as an accident, because the poison entered the systems of the claimants gradually over a period of months. The position of the department and possibly of the medical profession, the court said, seemed to be summed up by one of the department's expert witnesses when he testified that the condition from which the claimants were suffering was chronic and that such cases could not be construed to be accidents, because the poison entered the system gradually over a long period. The word "chronic," said the court, was used by the witness as an antithesis of "acute" and "sudden," and the poisoning was called a "disease" simply and solely because it was slow in developing. An occupational disease, as understood by the court, is

> one which is due wholly to causes and conditions which are normal and constantly present and characteristic of the particular occupation; that is, those things which science and industry have not yet learned how to eliminate. Every worker in every plant of the same industry is alike constantly exposed to the danger of contracting a particular occupational disease.

In the present instance, no such condition was shown. No poisoning occurred until the employed ignorantly or negligently shut off the ventilation, and, when the trouble was corrected, no more poisoning took place. No poisoning of similar character has occurred in like plants situated elsewhere. The court was therefore forced to hold that the injuries in the case before it resulted from a fortuitous event. A fortuitous event includes an accident. Although accidents usually occur suddenly, their effect is not always apparent. Authorities cited from other states are, because of different statutory provisions, not conclusive, but in the judgment of the court the great weight of authority tends to support the views stated by it. The judgment of the court below, reversing the action of the department of labor and industries and remanding the cases to it for classification and award in accordance with the law, was affirmed.

Physical and Mental Weakness and Undue Influence

(Harvey v. Provandie (N. H.), 141 A. 136)

The plaintiff, as executor, brought action to recover from the defendant the value of certain personal property alleged to have been wrongfully obtained from the testator a few days before he died. After a verdict in favor of the plaintiff, the defendant had the case transferred to the supreme court of New Hampshire. In the course of the trial, a physician, testifying for the defendant, was asked by the defendant's counsel if certain hypothetical circumstances indicated "unsoundness of mind." The trial court interpreted the question as calling for knowledge as to "the legal rule of sound mind." The phrase "of unsound mind," said the supreme court, is a legal, not a medical, phrase, and the witness did not profess to have any knowledge concerning the rule. The exclusion of the answer was therefore proper. The defendant requested that the jury be instructed that if the decedent was mentally competent to make a will he was mentally competent to make the transfer of his property. It was said in *Curtice* v. *Dixon*, 714 N. H. 386, 68 A. 587, that where a person disposes of his estate in view of approaching death, the question of his mental soundness is determinable by the rules which would be applied if the disposition were by will. In the present case, however, it did not appear that the decedent disposed of his property in view of approaching death, but that he expected to live. For that and for other reasons, the defendant could not complain of the failure of the trial court to give the requested instruction. A statement by the trial court that a gift by a person old and feeble and easily influenced, to one in attendance on him, might be viewed with suspicion, but that such a gift on examination might be found to be perfectly natural and proper; that if the donor, though ill and feeble, made the gift of his own free will and accord it was good; and that no hard and fast rule nor definite test could be applied, but that all the circumstances surrounding the act should be taken into account, was held by the supreme court to cover with substantial accuracy an instruction requested by the defendant that the fact that the decedent was physically infirm and mentally weak, old and illiterate gave rise to no presumption of undue influence. Judgment was entered on the verdict in the trial court.

Evidential Value of Examination Two Months After Rape

(State v. Smith (Idaho), 265 P. 666)

The defendant was convicted of the rape of the prosecutrix, a girl less than 18 years old. He appealed to the supreme court of Idaho. The offense was alleged to have been committed, March 8, 1927. The defendant contended that the trial court erred in admitting in evidence the testimony of a physician concerning his examination of the prosecutrix about May 1 of the same year. The supreme court held that the evidence was admissible notwithstanding the claim of its remoteness; objection went to the weight of the evidence rather than to its admissibility. It tended to establish that the prosecutrix had intercourse with some one, constituting rape at her age, and to that extent to corroborate her statements. The trial court refused to give the defendant's requested instruction, that proof of any injury to the prosecutrix's generative organs was not such corroboration of the commission of the crime as would justify the jury in finding the defendant guilty. The supreme court held that the refusal was proper. Such evidence might be plainly corroborative of the commission of the crime by some one, although it would not establish the defendant's connection with it. The judgment of the trial court was affirmed.

Evaluation of Expert Testimony

Brees v. Chicago, R. I. & P. Ry. Co. (Mo.), 4 S. W. (2d) 426)

This was an action under the Federal Employers' Liability Act for damages for personal injuries resulting from a collision between two motor cars on the defendant's railroad. The plaintiff had a verdict and judgment for $17,000, and the defendant appealed. He complained of an instruction given in the trial court, as follows:

> An expert witness is one who is skilled in any particular art, trade, or profession, being possessed of peculiar knowledge concerning the same, acquired by study, observation, and practice. Expert testimony is the opinion of such witness, based upon the facts in the case as shown by the evidence, but it does not even tend to prove any fact upon which it is based, and before you can give any weight whatever to the opinion of expert witnesses you must first find from the evidence that the facts upon which it is based are true. The jury is not bound by expert testimony, but it may be considered by you in connection with the other evidence in the case.

The supreme court held that this instruction was erroneous and therefore reversed the judgment and remanded the case. Quoting from the opinion in *Spencer* v. *Railroad* (Mo. Sup.), 297 S. W. 353, 357, the supreme court said:

> The first part of the instruction could very properly have been given if the experts' opinions had been based solely on hypothetical facts; but the propriety of giving in any case the direction embodied in the last sentence is extremely doubtful. The opinion of an expert, when admissible at all, is evidence; sometimes it is the only evidence by which

proof can be made (*O'Leary* v. *Scullin Steel Co.*, 303 Mo. 363, 260 S. W. 55), and its value as evidence is always for the jury (*Thompson* v. *Ish*, 99 Mo. 160, 12 S. W. 510, 17 Am. St. Rep. 552). Besides, what reason can there be for singling out the testimony of experts for comment and caution when their testimony must be considered and weighed just like the testimony of other witnesses? *Morrow* v. *Gas & Electric Service Co.*, 315 Mo. 367, 286 S. W. 106, 116.

Death After Sarcoma and Roentgen-Ray Burns

(Butler v. Rule (Ariz.), 265 P. 757)

The appellee, Rule, sued as the administratrix of the estate of one Holloway, who, while under treatment by the appellant for sarcoma by roentgen therapy, was seriously burned. This case was before the supreme court of Arizona on a previous occasion, and the judgment of the trial court was then reversed (*Butler* v. *Rule* [Ariz.], 242 P. 436, THE JOURNAL, July 31, 1926, p. 352). In the present action, judgment for the plaintiff was entered in the trial court, from which the defendant appealed to the supreme court of Arizona. The appellee's intestate had a sarcoma. Two physicians concluded that the case was too far advanced for operation and as a last resort sent the patient to the defendant for treatment by roentgen therapy. In the course of treatment, the patient sustained a serious burn, possibly because of overdosage. Thereafter the sarcoma became "painfully articulate in the left abdomen, leg and face." All of the medical witnesses testified that the swelling of the leg and abdomen and the paralysis of the left side of the face, and the pain resulting from them were due to interference with the circulation of blood by tumors distributed throughout the body. In the first trial there was evidence that the burn caused by the roentgen rays contributed to the patient's death. In the present trial, however, it was left to conjecture and doubt whether the treatment hastened her death. Considering the nature of sarcoma it was impossible to say that the patient would not have suffered any pain, or less pain, or would have lived longer, if there had not been a burn. The burden was on the plaintiff to show not only that the defendant was negligent, but that by reason thereof the patient's death was caused or hastened. Whether it was or was not must be shown by medical experts. From the evidence, it cannot be said definitely whether the burns or the sarcoma was the proximate cause of death. The rule, as laid down in *Matuschka* v. *Murphy*, 173 Wis. 484, 180 N. W. 821, is

> Where the proof discloses that a given result may have occurred by reason of more than one proximate cause, and that a jury can do no more than guess or conjecture as to which was in fact the efficient cause, the submission of such a choice to the jury has been consistently condemned by this court.

The court pointed out that under decisions previously made by it the personal representative suing for the benefit of an estate, in Arizona, could recover only the pecuniary damages suffered by the estate; that for present purposes it was immaterial whether the treatment did or did not cause pain which the deceased otherwise would not have suffered; and that therefore the trial court properly instructed the jury that recovery could not be had for mental anguish and pain. Because the plaintiff failed to sustain the burden of showing that the treatment caused or hastened the death of her intestate, the judgment of the court below, in her favor, was reversed and the cause remanded with directions that the case be dismissed.

Basis and Form of Expert's Determination of Disability

(Butler v. Armour Fertilizer Works (N. C.), 142 S. E. 483)

From a judgment for $5,000 in favor of the plaintiff, based on injuries caused by the negligence of the defendant, the defendant appealed to the supreme court of North Carolina. The defendant assigned as error the admission of the testimony of C., an osteopath, that in his opinion, formed after a personal examination of the plaintiff's leg and after his study of a roentgenogram, the plaintiff had suffered an impairment of his leg, by reason of the injury, of from 20 to 30 per cent. The supreme court held that the testimony was competent as evidence. It was not incompetent merely because the opinion was founded partly on a roentgenogram, nor was its competence affected by the fact that the witness expressed his opinion as to the extent of the injury in terms of percentage. The judgment was affirmed.

Society Proceedings

COMING MEETINGS

American Association for the Study of Goiter, Dayton, Ohio, March 25-27. Dr. K. W. Kinard, Bryant Building, Kansas City, Mo., Secretary.
American Association of Anatomists, Rochester, New York, March 28-30. Dr. Lewis H. Weed, Johns Hopkins Medical School, Baltimore, Sec'y.
American Association of Pathologists and Bacteriologists, Chicago, March 28-29. Dr. H. T. Karsner, 2109 Adelbert Road, Cleveland, Secretary.
Pacific Coast Surgical Association, Catalina Island, California, February 22-23. Dr. E. L. Gilcreest, Fitzhugh Building, Union Square, San Francisco, Secretary.

WESTERN SURGICAL ASSOCIATION

Thirty-Eighth Annual Meeting, held in Chicago, Dec. 14-15, 1928

The President, DR. KELLOGG SPEED, Chicago, in the Chair

Ludwig's Angina

DR. ASTLEY P. C. ASHHURST, Philadelphia: Ludwig's angina is a clinical entity, consisting of a septic cellulitis of the floor of the mouth and of the neck. Many cases usually classed under this head must be rejected. Pathologic and clinical differences exist between cellulitis and lymphadenitis or lymphangitis. In eighteen cases of Ludwig's angina seen by me there was a mortality of 27.7 per cent. Four cases resembled the condition superficially but were not really Ludwig's angina. The predominating rôle of dental infection as a cause stands out (from 65 to 83 per cent of cases). Anatomic studies were made demonstrating the routes by which the infection spreads. A median submental incision, and an incision in one or in both submaxillary regions, extending in all cases into the cavity of the mouth, are both valuable for drainage. The cause of death is usually sepsis.

Important Problems in the Treatment of Toxic Goiter

DR. ARNOLD S. JACKSON, Madison, Wis.: Much of the confusion that exists with regard to the successful treatment of hyperthyroidism is based on a failure to differentiate between the forms of toxic goiter and to make a correct diagnosis. A tabulation of the reports of leading surgeons shows that, in 1927, 3,189 operations were performed for toxic goiter, 1,552 operations, with sixteen deaths, for exophthalmic goiter, and 1,637 operations, with nineteen deaths, for toxic adenoma. There were thirty-one ligations and seventy-eight operations in more than one stage. Among the causes of fatality are listed the long continued use of iodine, hyperthyroidism, pneumonia, surgical complications and advanced cardiac lesions. Six of the surgeons reported cures with iodine of recurrent exophthalmic goiter, but the majority were unsuccessful. Twenty felt that the long use of iodine preoperatively increased the risk of operation in exophthalmic goiter; nine opposed this view. The average length of preoperative preparation was nine days. The majority stated that iodine given before operation resulted in improvement in a few but not all of the patients with toxic adenoma. Most of these men used digitalis in the preoperative preparation of selected patients with toxic adenoma.

Cholecystitis Associated with Diabetes

DR. ARTHUR N. COLLINS, Duluth, Minn.: If a cholecystitis complicates the diabetic picture, it is best to discover the fact as early as possible, before irreparable changes in the pancreas take place. There were pathologic gallbladders in 33 per cent of a group of diabetic patients studied. The females outnumbered the males in the ratio of 54 to 19. The gallbladder as a focus of infection in diabetic persons should be investigated. Cholecystectomy is preferable to gallbladder drainage in diabetes.

Some Causes for Failure in Surgical Treatment of Gastric Ulcer

DR. W. D. HAINES, Cincinnati: The fundamental principles of surgery for the relief of gastric and duodenal ulcer are sound. When these principles are correctly applied, relief from ulcer symptoms will follow in all save a small percentage of patients. If the symptoms of ulcer are not relieved by operation,

there may have been inaccuracy in diagnosis; a diseased gallbladder, appendix, tube, or other focus of infection permitted to remain in the patient; failure to excise the ulcer; other errors in technic; formation of a new ulcer, and lack of proper postoperative surveillance.

The Use of Oxygen in the Postoperative Treatment of Surgical Cases

DRS. E. STARR JUDD and LUIS A. PASSALACQUA, Rochester, Minn.: That the use of oxygen in the treatment of anoxemia and of the pulmonary conditions which produce oxygen unsaturation of the blood has a physiologic basis which is well grounded is revealed by a study of the literature. In 180 unselected cases oxygen was administered under one of three sets of circumstances: (1) as a prophylactic measure against pneumonia immediately after the operation; (2) as soon as the signs and symptoms of pulmonary congestion were recognized clinically, and (3) after the classic signs of pneumonia were present. In the first group were 105 patients among whom pneumonia did not occur. The same results were evident in the second series of forty-three patients with pulmonary congestion. In the third group of thirty-two patients with pneumonia not one casualty was registered, and the progress of the disease apparently was influenced by the use of oxygen. The possibility is suggested that oxygen acts as a prophylactic in the prevention of pneumonia and pulmonary congestion following operation and that it exerts a definite influence in breaking the vicious circle that may be formed in postoperative edema. There is a possibility that edema may be the primary condition that leads to a more severe condition. The influence of anoxemia and the importance of the use of oxygen to counterbalance the oxygen unsaturation must be considered. It does not seem necessary to prolong the administration of oxygen more than from eighteen to twenty-four hours when it is used as a prophylactic measure, although it can be used from sixteen to twenty hours a day for several days whenever this is necessary. An actual concentration of from 40 to 50 per cent is satisfactory.

Simple Solitary Ulcer of the Ileum

DR. CHARLES L. PATTON, Springfield, Ill.: Simple solitary ulcer is an unusual but definite lesion in the ileum. It is usually located in the lower third (no instances have been reported in the upper half of the ileum) opposite the mesentery in the vast majority of cases. It occurs most frequently in males between 30 and 50, although one case was reported at 8 years and one at 57. It occurs in individuals leading an active life and does not show any predilection for the aged or for those with sedentary habits. The gross and microscopic appearance is similar to that of simple ulcer of the stomach, duodenum, jejunum and colon. Its etiology and mode of production are not clear. Experimental ulcer has been produced in a variety of ways and many theories have been advanced as to its origin. Most of these are entirely speculative and there is no experimental or clinical confirmation of their validity. Constipation, hyperacidity, fixation of the bowel and trauma do not seem to be factors in the production of ulcers in this segment of the bowel. Thrombosis, emboli and blood stream infection seem more logical than surface infections. There is no definite clinical picture associated with this disease and it gives evidence of its presence only through accidental perforation. When recognized the disease should be treated surgically by suture or enterectomy. It is a definite cause of peritonitis and should be looked for, at operation, when the ordinary sites of perforation do not show any disease.

Megacolon Secondary to Carcinoma of the Sigmoid

DR. FRED W. RANKIN, Rochester, Minn.: The three cases which I am reporting, although agreeing pathologically in all particulars with Hirschsprung's description of congenital megacolon, were all produced by obstruction of a similar kind due to an encircling carcinoma of the sigmoid. The mechanism of this obstruction is easily explained and the method, as well as its results, coincides satisfactorily with the theory that obstructive processes, plus peristaltic action, result in hypertrophy of all the tunics of the large bowel. These cases presented formidable complications in addition to the malignant disease which was the underlying etiologic factor. In two of them acute obstruction was present, which necessitated an emergency measure for its relief. In the third case, chronic obstruction had produced a huge megacolon in which the retained fecal content had become a tumor irremovable by trocar and necessitating resection of three fourths of the colon, a most hazardous and dangerous procedure under any obstructive conditions.

Enterostomy in the Treatment of General Peritonitis

DRS. THOMAS G. ORR and RUSSELL L. HADEN, Kansas City, Kan.: Sufficient evidence has not been presented to justify the belief that death in general peritonitis is due altogether to intestinal obstruction. Enterostomy is without value in the treatment of the fulminating general peritonitis produced in the dog. It is probably of doubtful value in such cases in human beings. In selected cases of lower abdominal peritonitis, enterostomy is life saving. In doubtful cases of peritonitis, enterostomy should be used. It can do no harm and may do much good. Treatment of peritonitis should never exclude the administration of large quantities of salt solution to relieve the dehydration and hypochloremia.

Colofixation in "Chronic Appendicitis": Late Results

DR. E. P. QUAIN, Bismarck, N. D.: The diagnosis of chronic appendicitis is often made erroneously because ptosis of the right colon, especially in the presence of pericolic membranes, often produces similar symptoms. Follow-up studies of ninety-six such cases in which colofixation was made demonstrated that many patients with the classic symptoms of chronic appendicitis were not cured after appendectomy. When the same patients were operated on again and colofixation was made, their symptoms disappeared (fourteen cases). If colofixation alone is made in this type of patient and the appendix is left in situ, the symptoms of chronic appendicitis disappear exactly as in those cases in which the appendix is removed at the time of operation (four test cases made). Two different types of right-sided pains were present in the ninety-six cases. The technic of colofixation is described. Late results (from one to seven years after operation) showed 87.5 per cent cured, 9.3 per cent improved and 3.2 per cent unimproved. Relief from constipation was an outstanding result. Gain of weight was marked.

Bronchobiliary Fistula

DRS. M. G. SEELIG and J. J. SINGER, St. Louis: Bronchobiliary fistula is an unusual occurrence and in our case was never considered as a possibility until the bile appeared in the sputum. It was thought at the time of illness that the fever, chills and signs of septic pneumonia were secondary to a subphrenic accumulation of bile and pus. It is most probable that dilatation of the intrahepatic biliary passages occurred, with secondary inflammation, leading to abscess formation and perforation into the subphrenic space. Later the subphrenic abscess perforated the diaphragm, establishing a bimucous fistula between the bronchial tree and the intrahepatic bile capillaries and ducts through the intermediate agency of a suppurative pneumonitis. Prompt relief of symptoms followed the expulsion of bile and pus through the bronchial tree. A study of the roentgenograms shows very clearly the pulmonary lesion at the time of the acute symptoms and the clearing up of the pneumonic shadow after the bile was expelled.

The Surgical Treatment of Cardiospasm

Dr. O. F. LAMSON, Seattle, Wash.: Nearly two years ago, in desperation, I attempted esophagogastrostomy in an effort to relieve an enormously dilated esophagus which I had been treating for about ten years. A high midline vertical epigastric incision gives the best exposure, with a transverse incision at the lower end of the incision, if needed. In order to secure a good exposure of the diaphragm, it is necessary to excise the left lateral ligament of the liver which attaches the left lobe of the liver to the diaphragm. A transverse incision can then be made in the diaphragm to the right of the esophagus, extending almost to the esophagus. After satisfactory exposure of the field, an esophagoscope was passed to give a better view of the esophagus; this also enabled me to dissect it free and to obtain enough of the esophagus to pull through the diaphragm to anastomose it to the stomach. The presence of the eso-

phagoscope helped somewhat, as it enabled me to see the walls of the esophagus very distinctly. However, the adhesions were very dense, and as I was dissecting, the patient's condition became serious, necessitating the withdrawal of the esophagoscope. When his condition improved, I made a hasty incision in the stomach large enough to admit my hand. By passing an index finger into the cardia, then the second finger, and finally all four fingers, I succeeded in dilating the esophagus through the stomach. It was my intention to operate a second time at the end of about ten days or two weeks to make the anastomosis between the pouchy esophagus and stomach, but the patient was too weak and he had a postoperative mental disturbance, so that another surgical intervention did not seem warranted. However, he was considerably benefited by the digital dilation of the cardiospasm. I am convinced that such an esophagogastrostomy may also be successfully applied to diverticula of the lower end of the esophagus, which, heretofore, have been considered nonoperable.

Acute Pulmonary Edema Occurring During Pregnancy and Labor

DR. HARRY K. BONN, Los Angeles: Among seven patients with acute pulmonary edema occurring during pregnancy, labor or the puerperium, there were four deaths, one at the sixth and one at the eighth month of pregnancy, one very near to term and one during the first stage of labor. Of the three patients surviving the edema, one had an attack during the expulsive stage of labor, the other two during the puerperium. The following premises seem logical: A patient who has survived a previous attack of acute pulmonary edema occurring during pregnancy, labor or the puerperium and who has again become pregnant, is entitled to a therapeutic abortion. A tubal sterilization at the time of the abortion or later, as circumstances dictate, is also indicated. The choice of either the abdominal or the vaginal routes for the performance of the tubal sterilization is a personal matter. When acute pulmonary edema occurs during pregnancy or labor and the blood pressure is not unduly high, morphine is indicated. Under like conditions but with a high blood pressure, venesection is to be done. With either of the preceding conditions present, at the first sign of improvement, slight though it may be, the uterus should be emptied. For those patients near term or in labor, from a strictly obstetric point of view, dilation of the cervix, either manually or by the use of the bag, followed by version and extraction of the child, is the preferable procedure for emptying the uterus. From a surgical point of view, the procedure of choice is a classic cesarean section under local anesthesia, performed at the slightest evidence of improvement in the patient's condition and, at the latest, not longer than from four to six hours after the onset of the edema. It is questionable whether any delay is justifiable in these cases. Delay in emptying the uterus certainly minimizes the chances of securing a living baby and the possibility of the mother's recovery.

Complete Gastrectomy

Dr. STANLEY R. MAXEINER, Minneapolis: A man, aged 56, whose family history was entirely negative for cancer, had had malaria and dysentery during the Spanish-American War. On entrance to the hospital he complained of poor appetite, general weakness and loss of weight from 145 to 90 pounds (65.8 to 40.8 Kg.) in the past three months. He had pain in the abdomen and vomited two or three times a day. The acute symptoms were of only one month's duration. He had not vomited any blood or noted any black stools. Roentgen examination revealed an extensive cancer of the stomach, involving the pars pylorica and pars media, and an exploratory operation was advised. The operation was performed under local anesthesia of the abdominal wall and an anterior splanchnic anesthesia after the technic of Farr. Enlarged glands about the growth were sectioned at once and microscopic examination showed them to be inflammatory. The tumor was freely movable but involved the greater portion of the lesser curvature of the stomach. There were no metastases in the liver. The duodenum was divided with the cautery and the end inverted. The gastrohepatic and gastrocolic omentum with its gland-bearing areas was divided as far from the stomach as possible. Involvement of the cardiac end of the stomach necessitated division of the esophagus just below the diaphragm. The technic of Moynihan was not used, but after the freeing and pulling down of an additional half inch of the esophagus, an end-to-side anastomosis was accomplished by the use of Allis forceps. The jejunum was brought up anteriorly to the colon and because of the extreme length of the two parallel limbs of the jejunum, an entero-enterostomy was done between them. Because of the lack of security of the line of suture to the esophagus, the jejunum was anchored to the ligated stump of the gastric artery to relieve tension. The patient made an uneventful recovery. Roentgen examination after the operation showed the passage of food rapidly taking place through the parallel limbs of the bowel, with a moderate dilatation of the jejunum. The hemoglobin five months after operation was 75 per cent.

Fibromyoma of the Uterus in Relation to Pregnancy

DR. ROWLAND H. HARRIS, Battle Creek, Mich.: There are manifold relations between uterine fibromyoma and pregnancy which concern surgeons as well as obstetricians. Statistics with reference to sterility caused by fibromyoma must consider the desire not to have children, widowhood, the menopause, disease of the adnexa and other causal factors if they are to be accurate. Pregnancy and delivery may progress satisfactorily in the presence of large tumors. Uterine hemorrhage, breech and transverse positions of the fetus, high fetal mortality, stasis in the urinary and intestinal tracts, and sepsis are among the important effects of fibromyomas complicating pregnancy, labor and the puerperium. Diagnosis may involve great difficulty when early pregnancy is present in a fibromyomatous uterus and when a large soft myoma simulates pregnancy. Myomectomy is often followed by pregnancy in married women less than 40 years of age who are desirous of having children but are sterile on account of fibroids. Patients for myomectomy should be carefully selected and the right to do hysterectomy should be reserved by the surgeon, for radical operation may be necessitated by the presence of malignant tumors, by disease of the adnexa or by the impossibility of leaving a uterus safe for pregnancy. Myomectomy during pregnancy may be required on account of degeneration, torsion, impaction or the large size of fibromyomas. Hysterectomy during pregnancy is seldom necessary and should be done only when myomectomy cannot save the patient from accidents due to the tumor or when there is infection or a malignant condition of the tumors. Married women who have uterine fibromyomas of large size and have never been pregnant are often sterile for other reasons than the presence of the tumors, as is shown by the conditions found at operation.

Hysterotomy Under Local Anesthesia

DR. WILLIAM KERWIN, St. Louis: With local anesthesia the operator has no concern about the child and can expect a smoother convalescence for the mother. Success with the method depends on a few prerequisites, such as the confidence of the patient, thorough infiltration of the abdominal wall and parietal peritoneum, the gentleness and dexterity of the operator, a quiet operating room and noiseless handling of instruments, gentle retraction, very light sponging, and no packing of the intestine. The abdominal wall is infiltrated with 0.5 per cent procaine solution to which epinephrine has been added. The infiltration extends from the umbilicus to the symphysis pubis so as to encircle the midline. When the abdomen is open, the parietal peritoneum is injected outward for a distance of 2 inches from the incised margin. If this is not done retraction is painful. Infiltration of the uterus is unnecessary, as incision through the uterine wall is painless. The extraction of the child and placenta causes slight pain but gas anesthesia may now be given if the patient so desires. The uterus should not be lifted out of the abdomen, but light upward traction may be made to facilitate the suturing of the uterine incision. There are problems in obstetrics which can be solved only by cesarean section and in some instances a general anesthetic would be the final blow to the mother, whereas her life might be saved if local anesthesia were used. Furthermore, the life of the child is protected when both general anesthesia and preoperative administration of morphine are eliminated.

Current Medical Literature

AMERICAN

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American J. Diseases of Children, Chicago

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*Activated Ergosterol in Treatment of Rickets. S. Karelitz, New York. —p. 1108.
*Value of Liver Extract in Identifying and Treating Certain Anemias of Infancy and Childhood: Case of Probable Anemia in Infant Nine and One-Half Months Old. H. K. Faber, San Francisco.—p. 1121.
*Use of Bismuth in Treatment of Children with Congenital Syphilis. M. L. Bronson, New Haven, Conn.—p. 1136.
*Subacute Bacterial Endocarditis in Childhood: Twelve Cases. W. L. Rost and A. E. Fischer, New York.—p. 1144.
*Metabolism of Undernourished Children: Effect of High and Low Protein Diets. C. C. Wang, J. E. Hawks and M. Kaucher, Chicago.—p. 1161.
*Scarlet Fever: Use of Antitoxins. J. A. Toomey and E. G. Dolch, Cleveland.—p. 1173.
*Tumors of Spinal Cord in Childhood. B. Stookey, New York.—p. 1184.
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*Meckel's Diverticulum as Cause of Intestinal Hemorrhage. F. F. Tisdall, Toronto.—p. 1218.
Dilatation of Duodenum: Chronic Obstruction of Duodenum Congenital in Origin. J. A. Henske and R. R. Best, Omaha.—p. 1224.
*Acute Torsion of Undescended Testis in Infant, Aged Eight Months. G. J. Feldstein, Pittsburgh.—p. 1231.
Improving Value of Infant Mortality Rate as Index of Public Health Effort. D. F. Holland and G. T. Palmer, New York.—p. 1237.
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Activated Ergosterol in Treatment of Rickets.—Karelitz's results agree with those reported by others. All but one of the patients showed healing following the administration of a daily dosage of 5 minims, or 0.3 cc., of vigantol or 3.33 of activated ergosterol in oil, given over a period of from three to eight weeks. A colored child, aged 7 months, who had craniotabes with moderately severe rickets, was definitely improved in seven days following the administration of 6 mg. daily, and the condition healed in ten days. The other children showed healed craniotabes in from fourteen to twenty-one days. Roentgen evidence of healing in the long bones was seen as early as twelve days, but it usually required three weeks. Patients with tetany were cured in fourteen days. Healing took place despite complicating diseases, such as pneumonia or grip. The general disposition of the children seemed to improve after two weeks. In the mild and moderate cases of rickets, a complete filling in of the metaphyses occurred in about six weeks, but in an extreme case the condition had not completely healed in eight weeks, although each week after the third a definite and marked improvement was seen over the preceding observations. The blood calcium and phosphorus usually returned to the normal amount within about two weeks. There did not seem to be any difference in the results obtained with the German and with the native preparations of vigantol.

Value of Liver Extract in Anemias of Infancy.—Three cases of severe anemia in infancy and early childhood with blood pictures resembling that of primary anemia are reported by Faber. In two patients—an infant, aged 12 weeks, and an infant, aged 9½ months—a striking clinical and hematologic improvement associated with a characteristic transient rise in the circulating reticulocytes closely followed the administration of Cohn-Minot fractional liver extract. In the third patient, a boy, aged 4½ years, there was no response of any ascertainable sort to liver extract, and prompt improvement resulted from transfusion of blood. One of the patients, an infant, aged 9½ months, probably had true pernicious anemia, as shown by the blood picture, achlorhydria and a typical response to the administration of liver extract. If these criteria are acceptable as conclusive of the diagnosis, this is the earliest authenticated case of pernicious anemia on record. Complete recovery from anemia does not necessarily follow the administration of liver extract, even when a definite response is obtained, since in both infants who showed such a response a marked deficiency in hemoglobin persisted after the red cells had reached approximately normal numbers. An increase in the circulating lymphocytes may sometimes occur following the administration of liver extract. Apart from the possibly still debatable question of the occurrence of primary anemia in infancy, there does not appear to be any doubt that as early as the sixth week of human life, a type of anemia does occur in which the maturation of erythrocytes in the bone marrow is defective or inadequate and in which liver extract is of striking therapeutic value.

Bismuth Treatment of Congenital Syphilis.—Thirty-one children with late congenital syphilis were treated by Bronson with potassium bismuth tartrate and butyn as part of the antisyphilitic treatment. The dose was 0.1 Gm., injected intramuscularly into the buttocks once a week. The effect of the drug has been tried in cases of interstitial keratitis, of syphilis of the central nervous system, of arsenic intolerance, of fixed Wassermann reactions and in certain other conditions. The effect of bismuth on patients with acute interstitial keratitis seems to have been favorable in the small group treated. The children with syphilis of the central nervous system have shown clinical as well as serologic improvement. The most valuable use of bismuth is in the treatment of children who are intolerant to arsenic. Bismuth has been sufficiently effective in changing fixed Wassermann reactions to make its use indicated in these cases. The drug is well tolerated by most children.

Subacute Bacterial Endocarditis in Childhood.—Attention is called by Rost and Fischer to the fact that subacute bacterial endocarditis in childhood is not rare, although one may be led to believe this because some of the best textbooks on pediatrics fail to mention the disease. The literature has been reviewed and reports of sixty-four cases in children under 14 years of age have been collected. Twelve additional cases in children under 13 years of age are reported.

Metabolism of Undernourished Children.—A study made by Wang et al. of the caloric and nitrogen balance of normal and undernourished children on high and low protein diets shows the following results: 1. The caloric loss in the urine varies directly with the protein output and therefore with the protein intake. 2. The ratio of calories to nitrogen in the urine also varies directly with the protein intake. 3. Nitrogen retention is directly proportional to nitrogen intake. 4. The percentage utilization of the calories in a person on a low protein diet is greater than in one on a high protein diet, owing to the higher coefficient of digestibility of the food mixture of the low protein diet. 5. Underweight children seem to utilize the nitrogen of a low protein diet more efficiently than do normal children. 6. A striking gain in weight follows an increase of the protein in the diet, even in normal children. This is especially marked in undernourished children. 7. A diet containing 4 Gm. of protein per kilogram of body weight is recommended for undernourished children. 8. It is also recommended that the diet of all children, normal or underweight, should contain 1 quart of milk. This is necessary on account of the protein content of this food, as well as on account of its content of calcium and vitamins.

Antitoxin Treatment of Scarlet Fever.—Toomey and Dolch present a series of 283 patients who were treated with scarlet fever antitoxin, and of sixty to whom treatment was not given. They did not notice any convincing difference in the patients treated intramuscularly and in the untreated patients as to toxicity, duration of rash or complications. The first fourteen patients treated intravenously showed marked improvement. The remaining forty did not show any marked betterment as compared to control patients, and three of the forty died in a fashion that was suspiciously anaphylactic. The sickness that has been experienced following the use of serum is extremely severe; in fact, it is usually more severe than the disease itself. The authors believe that at the present time

the evidence in favor of the use of scarlet fever antitoxins is neither clear cut nor decisive.

Tumors of Spinal Cord in Childhood.—Eight cases of spinal cord tumor in children 12 years of age or under are analyzed by Stookey. While tumors of the meninges and of the nerve roots are most common in adults, they did not occur in the present series in children. Tumors of the spinal cord in children fall into two groups: an intramedullary group and an extradural group. Tumors of the intramedullary group vary in their pathologic processes and are likely to be tumors arising from congenital rests within the neural tube. The extramedullary group are usually sarcomas or fibrosarcomas. The average age of the children in the intramedullary group was 11 years and of those in the primary extradural group, 9 years; in the group of secondary extradural tumors there was an average age of 3 years. The most common levels were the lower cervical and upper thoracic segments. Extreme variability in the presenting symptom was found, even with tumors in approximately the same segmental level. Pain, either general or localized, was not found over the vertebral column. Bladder and rectal disturbances are rare and occur only late in the history. Lumbar puncture with withdrawal of fluid may be of value in causing an increase in the sensory signs already present, or in permitting a sensory level to be established which could not previously have been determined. The lumbar manometric test has been invaluable. Without it the diagnosis of tumor of the spinal cord would not have been made in 50 per cent of the cases reported. A routine lumbar manometric test should be done whenever disease of the spinal cord is suspected. When there is doubt as to the diagnosis of tumor of the cord, Stookey says exploration is always indicated. The operative results are satisfactory. Death did not occur in the series here reported.

Idiopathic Enlargement of Heart in Infants.—A review of the literature on all cases considered or called idiopathic hypertrophy, enlargement, dilatation or congenital hypertrophy is presented and analyzed by Stoloff. Six of the total of thirty-four reported cases are excluded from consideration because of some anomaly or abnormality which might have played an etiologic rôle. In five of the remaining twenty-eight cases, a histologic examination was not made. A thorough microscopic study is essential to establish the etiology and to classify the condition. On histologic examination, six of the remaining twenty-three cases showed myocardial disease which placed them outside the category of true idiopathic enlargement. There remain then only seventeen instances which might be considered true idiopathic enlargement of the heart in infancy and in childhood. An additional case is presented which was considered idiopathic until microscopic studies of all parts of the heart revealed lymphocytic infiltrations and myocardial degeneration which was generalized enough to explain the enormous enlargement of the heart.

Meckel's Diverticulum as Cause of Intestinal Hemorrhage.—At the age of 5½ months, Tisdall's patient had a profuse hemorrhage from the bowels. Five stools, consisting largely of dark red blood, were passed. No cause for the hemorrhage was found. One month later, he again passed two stools consisting largely of dark red blood. Again a cause for the hemorrhage was not discovered. At the age of 11 months, the infant stopped gaining weight and became constipated. A transfusion of blood was given, apparently for its general tonic effect, but benefit was not observed. The constipation became more marked and the patient refused the greater part of his feeding. The chief point of interest, on examination, was the presence in the upper right quadrant of the abdomen of a definite mass which projected out into the flank. Marked peristaltic waves were seen passing from the region of this mass across the abdomen from right to left. Smaller peristaltic waves were seen all over the abdomen. Under dietetic treatment the patient improved. Then he developed an infection of the upper respiratory tract, and died. At autopsy, on removal of some of the intestinal coils, a large mass was found lying retroperitoneally. It occupied the entire upper right quadrant of the abdomen, extending laterally from the right flank to slightly beyond the midline and vertically from the lower posterior border of the liver to the sacral promontory. It was approximately the size of the stomach. Part of the cecum, the ascending colon and the proximal portion of the transverse colon lay over the mass. From the posterior lower surface of the mass, a tube identical in appearance with the small intestine ran forward in the layers of the mesentery for a distance of about 9 cm. This tube then fused with the normal small intestine and continued beside it for 50 cm., ending in a small, knoblike enlargement of the small bowel, 45 cm. from the cecum. Although fused with the normal bowel, the abnormal tube could readily be distinguished throughout its entire length. When the bowel was opened, it was found that the abnormal tube was in the nature of an outgrowth from the normal bowel. Throughout the fused portion a simple wall separated it from the lumen of the normal bowel. Shortly before the abnormal tube entered the tumor, it was markedly constricted and fibrosed at two points, so that only a very small probe could be passed. The wall of the tumor was somewhat thicker than a wall of the stomach. The tumor was filled with clear fluid and some material resembling meconium. The remaining portion of the tube could not be distinguished macroscopically from the normal bowel. Evidence of an ulcer was not found. Tisdall advises that the presence of a bleeding Meckel's diverticulum be considered an etiologic factor in cases of intestinal hemorrhage of obscure origin, particularly in male children.

Acute Torsion of Undescended Testis in Infant.—Torsion of an undescended testis in the left inguinal canal is reported by Feldstein in an infant, aged 8 months. A summary of the etiologic factors and the theories of causation of the condition is presented, together with a discussion of the symptoms, physical signs, diagnosis and treatment.

Archives of Otolaryngology, Chicago

8: 629-744 (Dec.) 1928

*Otologic and Other Manifestations of Diet Deficient in Vitamins. R. A. Barlow, Madison, Wis.—p. 629.
Roentgenologic Signs Which Indicate Extension of Infection from Ethmoid and Sphenoid Sinuses to Base of Skull. G. E. Pfahler, Philadelphia.—p. 638.
How and When Mucous Membrane of Maxillary Sinus Regenerates: Experimental Study in Dog. C. D. Knowlton, Boston.—p. 647.
New Technic for Ligation of Vessels in Tonsillectomy. W. A. Wells, Washington, D. C.—p. 657.
Roentgenograms of Sphenoid and Ethmoid Sinuses: Oblique Method. A. P. Overgaard, Omaha.—p. 663.
*Foreign Bodies in Stomach and in Intestines. M. C. Myerson, New York.—p. 675.
Cicatricial Stenosis of Larynx: High Tracheotomy in Three Cases. M. F. Arbuckle, St. Louis.—p. 686.
Dental Caries in Paranasal Sinus Infections. G. Berry, Worcester, Mass.—p. 698.
Relation of Otolaryngologic Disease to Mental Disease. G. B. M. Free, Danville, Pa.—p. 707.
Endonasal Surgery with Aid of New Instrument: Simplified Technic. A. Wachsberger, New York.—p. 712.
Removal of Benign Tumor of Larynx with Potassium Bichromate. R. M. Colbert, New York.—p. 715.
Exposure and Illumination of Pharynx and Larynx by General Practitioner: New Laryngoscope Designed to Simplify Technic. P. Flagg, New York.—p. 716.
Demonstration of Nonopaque Foreign Bodies in Esophagus. H. G. Reineke, Cincinnati.—p. 718.
Laryngeal Tuberculosis. G. B. Wood, Philadelphia.—p. 720.
New Instrument for Introducing Catheter into Eustachian Tube. L. K. Pitman, New York.—p. 729.

Relation of Avitaminosis and Deafness.—Results of animal experiments lead Barlow to conclude that vitamins A and B are not factors in bony changes in the internal ear, and a diet deficient in these vitamins is not a predisposing cause of deafness. Deficiency of vitamin A causing changes in the mucous membrane of the respiratory tract might be considered as a possible factor in the production of changes in the soft tissue of the middle ear, which might become permanent.

Foreign Bodies in Stomach and Intestine.—According to Myerson, the value of such substances as cornmeal, thick cereals, mashed potatoes, bran and similar foods for encasing pointed foreign bodies is questionable. The prevailing belief that a cathartic is harmful in the presence of a pointed foreign body is also open to question. Twenty-two of the author's thirty-nine patients received a cathartic and did not suffer any ill effect. It would be well, however, to consider that a cathartic may not be harmless in such cases. It is important that those who come in contact with cases in which foreign bodies have been swallowed should be acquainted with the

various phases of the subject. No surgeon would care to operate on the stomach of an infant unnecessarily; yet many infants' stomachs are opened because of the desire of the family, and sometimes also of the physician, for quick and visible results. It is well known to those who have seen infants operated on that babies under 1 year of age do not stand gastrotomy well. It would be better to operate after a more positive indication than the mere presence of a foreign body in the stomach for a short time. Gastrotomy would be indicated, first, when there are signs of perforation, and, secondly, when a large body will not pass the pylorus and the procedure of gastroscopy has been resorted to or found inadvisable. All patients who have swallowed foreign bodies which are sharp, or foreign bodies the passage of which appears to be delayed, should be kept under observation until the object has been evacuated or until its absence from the bowel tract has been demonstrated.

Archives of Physical Therapy, X-Ray, Radium, Omaha

9: 523-570 (Dec.) 1928

Treatment of Tumors of Bladder by Surgical Diathermy. A. G. Fleischman, Des Moines.—p. 523.
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Arkansas M. Society Journal, Little Rock

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Peritonitis Complicated with Acute Ileus. A. O. Morton, Sarasota.—p. 289.
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Roentgen Diagnosis of Pulmonary Tuberculosis. L. W. Cunningham, Jacksonville.—p. 298.
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Illinois Medical Journal, Oak Park

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Indiana State M. Association Journal, Fort Wayne

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Physical Therapy: Conclusions from Study of 627 Cases. F. J. Martin and A. K. Harcourt, Indianapolis.—p. 513.
Relative Value of Symptomatology in Diagnosis of Diseases of Urinary Tract. A. J. Sparks, Fort Wayne.—p. 515.
Tonsillectomy in Pulmonary Tuberculosis. J. C. Boone, South Bend.—p. 518.
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Iowa State M. Society Journal, Des Moines

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Journal of Laboratory & Clinicval Medicine, St. Louis

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*Effect of Ether Anesthesia and Shock on Calcium of Blood. W. C. Emerson, Rochester, N. Y.—p. 195.
*Physiologic Behavior of Glyceryl Trimargarate. D. L. R. Moore, M. Breckenridge and H. C. Koser, Urbana, Ill.—p. 201.
*Immediate Fall of Blood Cholesterol After Eating or After Histamine Injection. B. S. Cornell, Toronto.—p. 209.
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*Diazo Test in Nephritis. S. H. Polayes, M. Lederer and W. Z. Fradkin, New York.—p. 229.
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Practical Uses of Heparin. C. I. Reed, Dallas, Texas.—p. 243.
*Combined Peroxidase and Wright's Stain for Routine Blood Smears. A. H. Washburn, San Francisco.—p. 246.
Accurate Colorimetric Technic for Blood and Tissue Cholesterol Estimations. B. S. Cornell, Toronto.—p. 251.
Celluloid Corrosion Technic for Study of Normal and Pathologic Variations of Arteries of Kidney. N. W. Barker, Rochester, Minn.—p. 257.
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Special Knife for Decerebration. E. Karrer and H. C. Stevens, Cleveland.—p. 266.
Pyrex Glass Burner for Production of Sodium Light. E. S. West, St. Louis.—p. 267.

Effect of Ether Anesthesia on Blood Calcium.—The serum calcium of the blood was determined by Emerson in ten dogs before and after ether anesthesia. A week later the serum calcium in the blood of the same dogs was determined before and after ether anesthesia. A week later five of the dogs were operated on under ether anesthesia and the serum calcium of the blood was determined before and after the operation. There was a definite increase, 18 per cent, in the serum calcium of the blood following ether anesthesia. There was an increase, 20 per cent, in the serum calcium of the blood following asphyxia. There was a slight decrease in the serum calcium of the blood following anesthesia in which there was hyperventilation. A slight amount of asphyxia during ether anesthesia was of value as it tended to raise the serum calcium content of the blood and thus shortened the coagulation time. Shock did not have any effect on the serum calcium of the blood.

Physiologic Behavior of Glyceryl Trimargarate.—Three healthy young women were given diets poor in carbohydrates and rich in fat by Moore et al., most of the fat being in the form of butter during the two or three-day preliminary periods, and in the form of glyceryl trimargarate (intarvin) in the three-day experimental periods. Comparison of these two fats was made as to their effects on acidosis produced by the ketogenic diets. Quantitative determinations of creatinine, ammonia, total acidity, organic acids and acetone bodies were made in twenty-four hour urine specimens; the percentage of fat absorbed was estimated in one instance. Large amounts of ammonia, acetone bodies, organic acids and titratable acids were excreted by the subjects in all of the experiments; these quantities were generally larger during the periods of intarvin ingestion. Therefore, intarvin did not appear to act as an antiketogenic substance nor to have the power to lessen the degree of acidosis produced in normal individuals by a high-fat diet; on the contrary, it was probably oxidized in the body

with the resulting formation of acid substances, which tended to increase the acidosis. Intarvin was slightly less completely absorbed by the intestine than was butter.

Effect of Eating and of Histamine on Blood Cholesterol.—The only practical point arising from Cornell's work is the fact that eating or the injection of histamine causes a fall in the blood cholesterol of from 10 to 30 per cent. This point should be taken into consideration in all estimations on animals or on man. So far as can be judged at present, there is considerable evidence that most, or perhaps all, of the cholesterol leaving the blood goes to the liver. The reason for this hepatic determination of cholesterol is obscure but it seems to be associated with the process of alimentation, and may occur independently of any gastric secretion.

Diazo Test in Nephritis.—Of the 1,000 specimens of blood examined by Polayes et al., twenty-four, or 2.4 per cent, gave a positive reaction to the diazo test. Of the twenty-four patients, at least two failed to show a severe or even moderate degree of renal injury, as far as could be determined clinically or from laboratory tests. There is no constant parallelism between the phenolsulphonphthalein excretion and the presence of a positive diazo reaction. Two cases are cited in which the diazo test was positive in the presence of a phenolsulphonphthalein excretion of 50 per cent in two hours, and conversely, five cases are cited in which the nonprotein nitrogen of the blood is high and in which the phenolsulphonphthalein test was quite low and the diazo test was negative. The same applies to creatinine. A positive diazo test, apparently, is not so ominous a prognostic sign if there are no other evidences of renal disease or blood nitrogen retention. The positive reaction in these cases may disappear and the patient may recover. A combination of a positive diazo reaction and a high degree of creatinine retention is of greater prognostic significance than either one alone. The presence of both indicates a very poor prognosis.

Combined Peroxidase and Wright's Stain for Blood.—A new method is described by Washburn for the demonstration of the peroxidase reaction in white blood cells. The process consists of three steps: staining with a modification of Goodpasture's stain; decolorizing with 95 per cent alcohol, and counterstaining with Wright's stain. In modifying Goodpasture's stain a solution has been obtained which will remain stable for from eight to twelve months. By this method one may obtain a clear-cut picture of the peroxidase content of each cell without interfering with its routine classification by means of Wright's stain alone.

Journal of Infectious Diseases, Chicago

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Use of Pectin in Fermentation Tests. E. McCoy and W. H. Peterson, Madison, Wis.—p. 475.
*Relationship Between Chronic Intestinal Stasis and Anemia. P. R. Cannon, Chicago.—p. 480.
Hemolytic Substance in Pneumococcus Culture Broth. G. M. Sickles and J. M. Coffey, Albany, N. Y.—p. 490.
Botulinus Toxin: 5. Influence of Nitrogenous and Lipoid Compounds on Potency of Botulinus Toxin. E. W. Sommer and H. Sommer, San Francisco.—p. 496.
*Poison Produced by Bacterium Enteritidis and Bacterium Aertrycke Which Is Active in Mice When Given by Mouth. S. E. Branham, L. Robey and L. A. Day, Chicago.—p. 507.
*Neisseria Subflava (Bergey) Meningitis in Infant. H. Benson, R. Brennwasser and D. D'Andrea, Chicago.—p. 516.
*Opsonification Test for Rapid Identification of Streptococcus of Scarlet Fever. K. M. Howell and M. Werner, Chicago.—p. 525.
Units of Protective Antibody in Antipneumococcus Serum and Antibody Solution. L. D. Felton, Boston.—p. 531.
Concentration of Pneumococcus Antibody. L. D. Felton, Boston.—p. 543.
Spontaneous Tuberculosis of Rabbits. M. J. Harkins and E. R. Saleeby, Philadelphia.—p. 554.
*Immunologic Investigations on Tropical Sprue in Porto Rico: Biology of Monilia Psilosis in Relation to Sprue. C. Weiss and F. Landrón, San Juan, P. R.—p. 557.
Extracellular Production of Toxin by Clostridium Botulinum Type B. C. N. Stark, J. M. Sherman and P. Stark, Ithaca, N. Y.—p. 565.
Glucose Inhibition of Extracellular Toxin-Producing Enzymes of Clostridium Botulinum. C. N. Stark, J. M. Sherman and P. Stark, Ithaca, N. Y.—p. 566.
Destruction of Diphtheria Toxin by Bacteria. C. N. Stark, J. M. Sherman and P. Stark, Ithaca, N. Y.—p. 569.

Relationship Between Chronic Intestinal Stasis and Anemia.—An investigation was undertaken by Cannon primarily to determine whether or not a chronic intestinal obstruction in the presence of a proteolytic intestinal flora would lead to excessive blood destruction. Chronic intestinal obstruction with resulting stasis in the ileum was produced in forty-five albino rats. Diets favoring the development of proteolytic bacteria were fed to such animals in an attempt to determine whether or not hemolytic substances may be formed and absorbed and thus lead to an anemia. In most instances, no significant anemia occurred; whenever it did develop under these conditions, it was possible to demonstrate evidences of a concomitant acute infection. Cannon says that chronic ileal stasis in the albino rat, with a proteolytic intestinal flora, may be present for several weeks with no significant increase in blood destruction, provided an intercurrent infection does not supervene. Consequently from experiments one cannot conclude that an anemia is due to the absorption of hemolytic substances from the lumen of the bowel until all evidences of acute infection have been eliminated by bacteriologic and histologic procedures.

Poisoning Produced by Bacterium Enteritidis and Bacillus Aertrycke.—Seventeen strains of paratyphoid bacteria, isolated by Branham et al. from foods, or rodents, or from persons infected during food poisoning outbreaks, produced fatal infection in 100 per cent of the mice to which they were fed. These strains included seven of *Bacterium enteritidis*, nine of *Bacillus aertrycke*, and one of *Bacterium schottmülleri*. When boiled broth cultures and Berkefeld N and W filtrates of broth cultures of these strains were fed similarly to mice, a mortality of approximately 40 per cent occurred. When whole unfiltered cultures in beef heart medium are boiled or autoclaved, and then fed to mice, the mortality is often from 40 to 100 per cent. Feeding autolyzed, boiled or autoclaved suspensions of the washed bacteria had little, if any, effect. Filtrates of twenty-four hour cultures produced a higher mortality than those from cultures which were incubated for longer periods of time. In its remarkable heat stability this poison resembles the other toxic materials which have been described in the paratyphoid group, but its surprisingly long incubation period seems to separate this toxic substance quite definitely from that responsible for the violent gastro-intestinal symptoms occurring in man after the eating of foods containing these bacteria, and from any other toxic product of these bacteria that has yet been described.

Neisseria Meningitis.—Benson et al. describe the clinical progress, the bacteriology and the results of the postmortem examination, including an extended account of the alterations in the brain, of a chronic meningitis in a child, aged 7 months, from whose spinal fluid *Neisseria subflava* was repeatedly isolated. Anatomically there was a marked internal hydrocephalus and a pressure displacement by a circumscribed abscess of the tissues of the inferior portion of the cerebellum and the upper part of the spinal cord. The prolonged mild course of the illness, which continued for about three months, was a notable clinical feature.

Opsonification Test for Identification of Scarlatinal Streptococcus.—Although the opsonification test for the identification of scarlet fever streptococci was not absolutely specific in the cases studied by Howell and Werner, it is nevertheless believed to offer a rapid, valuable aid in the diagnosis of scarlet fever.

Tropical Sprue in Porto Rico.—The observations made by Weiss and Landrón do not support the theory that *Monilia psilosis* is an etiologic factor in tropical sprue.

Journal of Urology, Baltimore

20: 635-748 (Dec.) 1928

*Diverticula of Urinary Bladder. W. E. Lower and C. C. Higgins, Cleveland.—p. 635.
Vesicovaginal Fistula: Suprapubic Transvesical Operation. F. Farman, Los Angeles, and R. C. Thompson, Whittier, Calif.—p. 663.
Epispadias in Females and Its Surgical Treatment. D. M. Davis, Rochester, N. Y.—p. 673.
*Modified Coffey Technic for Uretero-Intestinal Anastomosis. H. D. Furniss, New York.—p. 689.
*Obstruction to Venous Circulation in Kidney Caused by Distention of Pelvis and Calices: Pyelovenous Backflow. J. C. Ferrer, San Juan, P. R.—p. 701.
*Renal Circulation Following Various Types of Elongations of Pyelotomy Incisions. C. L. Deming, New Haven, Conn.—p. 713.
*Experimental Sensitization per Vaginam with Proteins from Male Gonads. D. I. Macht, Baltimore.—p. 733.

Diverticula of Urinary Bladder.—Lower and Higgins analyze 110 cases and present a brief review of the literature. Excision of the diverticulum was performed in forty-three of the cases reported. There were three operative deaths, a mortality rate of 7 per cent. Twelve of the patients have not been traced since operation. Five have died since operation: one, within a month after the operation, of papilloma of the diverticulum; one within the first three months and one within the first year (cause unknown); one, two years after operation, of carcinoma of the stomach, and one thirteen years after operation. Of the remaining twenty-one patients who have been observed for periods varying from six months to fourteen years—the average postoperative period being four years—twelve have shown marked improvement, and in nine there was complete relief of symptoms.

Uretero-Intestinal Anastomosis.—Furniss has modified the Coffey method, in a few details, the principal modification being the preservation of more of the ureteral blood supply; this was accomplished by retaining the peritoneal attachment of the ureter when freeing the portion to be anastomosed.

Obstruction to Venous Circulation of Kidney.—Ferrer states that a distention of the renal pelvis and calices to their normal capacity will produce a distinct, partial obstruction to the outflow of venous blood in the kidney. The obstruction produced is proportionate to the degree of distention. Pyelovenous backflow will be only a temporary phenomenon, and will persist only so long as the venous outflow fails to increase in pressure sufficiently to overpower that of the backflow. An obstruction to the free outflow from the renal pelvis will tend to produce renal passive congestion. A continuously distended pelvis may aid in the formation of hydronephrosis. More care should be exercised in pyelography and, as a rule, one should rely on small amounts of concentrated solution administered frequently rather than on weak but larger amounts of fluid.

Renal Circulation After Pyelotomy.—Deming asserts that renal circulation following elongation of a pyelotomy incision straight on to the kidney and to the lower pole is not impaired when the retropelvic vessels are conserved. Angulated incision causes a definite shrinkage of the kidney and the corrosion model. Elongation of a pyelotomy incision to the lower pole near the midline is the incision of choice. The suture of the kidney wound should not include any of the larger vessels. Ligation of the retropelvic vessels causes renal injury which is not reparable in four months.

Experimental Sensitization by Vagina.—After a successful series of experiments had been performed on sensitization of guinea-pigs by instillation of blood serum into the vagina, a series of experiments were conducted by Macht with instillations of fresh prostatic and testicular emulsions, and positive evidence of sensitization produced in guinea-pigs in this way has been obtained.

Laryngoscope, St. Louis

38: 761-808 (Dec.) 1928

Effect of Sinusitis on Certain Syndromes of Chiasmal Tumor. H. I. Lillie and W. I. Lillie, Rochester, Minn.—p. 761.
Nasal Polypi in Eight Year Old Child: Case Presentation. A. Michaelis, New York.—p. 776.
Rhinolalia Aperta After Tonsillectomy. D. L. Poe, New York.—p. 778.
Otitic Pyemia Without Sinus Thrombosis. T. E. Beyer, Denver.—p. 785.
Complete Facial Paralysis and Meningitis During Acute Mastoiditis: Case. D. N. Husik, Philadelphia.—p. 790.
Short Reports of Five Interesting Cases of Acute Mastoiditis. C. H. Smith, New York.—p. 794.
Local Tonsillectomy by LaForce Method. S. Cohen, Philadelphia.—p. 799.

Maine M. Association Journal, Portland

19: 215-232 (Dec.) 1928

Appendicitis in Children. T. A. Foster, Portland.—p. 215.
Vincent's Angina: Cases. P. E. Gilbert, Madison.—p. 219.

Medicine, Baltimore

7: 383-466 (Dec.) 1928

Pleural and Pulmonary Lesions in Rheumatic Fever. J. R. Paul, Philadelphia.—p. 383.
Summary of Present Knowledge of Tularemia. E. Francis, Washington, D. C.—p. 411.
Metabolism of Nerves. W. O. Fenn, Rochester, N. Y.—p. 433.

Occupational Therapy and Rehabilitation, Baltimore

7: 379-450 (Dec.) 1928

Mental Mechanisms. G. R. Jameison, White Plains, N. Y.—p. 379.
Occupational Therapy for Tuberculosis. S. B. English, Glen Gardner, N. J.—p. 391.
Crafts and Personality in Treatment of Mental Disorders. P. G. Gundersen, White Plains, N. Y.—p. 395.
Preindustrial Shop: Problems, Organization and Methods. H. A. Robeson, Kings Park. N. Y.—p. 401.
Psychiatric Social Work. T. Land, Worcester, Mass.—p. 407.
Occupational Therapy Submerged. I. B. Houston, Waterbury, Vt.—p. 413.

Oklahoma State M. Association Journal, Muskogee

21: 273-308 (Oct.) 1928

Present Trend of Thought in Kidney Functions and Diseases. L. A. Turley, Oklahoma City.—p. 273.
Acute Upper Respiratory Conditions in Childhood. W. M. Taylor, Oklahoma City.—p. 276.
Management of Laryngeal Diphtheria. T. G. Wails, Oklahoma City.—p. 278.
Foreign Bodies in Air Passages. J. C. Braswell, Tulsa.—p. 279.
Chronic Purulent Otitis Media Combined Treatment. I. D. Walker, Blackwell.—p. 281.
Evisceration with Gold Ball Implantation. W. A. Huber, Tulsa.—p. 283.
Aseptic Cavernous Sinus Thrombosis. H. C. Todd, Oklahoma City.—p. 286.
Transport Mechanism of Alimentary Tract and Significance in Constipation. C. F. McClintic, Detroit.—p. 290.

Pennsylvania Medical Journal, Harrisburg, Pa.

32: 129-210 (Dec.) 1928

Our Changing Knowledge of Eczema. W. A. Pusey, Chicago.—p. 129.
*Cancer Situation in Pennsylvania. T. B. Appel, G. B. L. Arner and H. B. Wood, Harrisburg.—p. 134.
Id.: General Education for Control. H. F. Smith, Harrisburg.—p. 140.
Id.: Places to Start Investigation. S. P. Reimann, Philadelphia.—p. 142.
Coronary Disease. R. W. Scott, Cleveland.—p. 145.
Obstetric Paralysis: Early Treatment. V. Mooney, Pittsburgh.—p. 149.
Symposium on Current Urologic Problems: Everyday Genito-Urinary Problems. H. C. Winslow, Meadville.—p. 151.
Id.: Importance of Early Differential Diagnosis in Genital Ulcerations in Male. L. B. Greene, Philadelphia.—p. 153.
Id.: Keeping Patient Dry After Vesical Operations. S. W. Moorhead, Philadelphia.—p. 155.
Backache. A. M. Rechtman, Philadelphia.—p. 159.
Relations Between Ophthalmology and Internal Medicine. H. Friedenwald, Baltimore.—p. 162.
*Bronchiectasis: Chronic, in Childhood: Undernutrition. E. S. Thorpe, Jr., Ardmore.—p. 168.
Id.: Bronchoscopic Treatment of Bronchiectasis in Children. W. F. Moore, Philadelphia.—p. 170.

Cancer in Pennsylvania.—The indications from this statistical study by Appel et al. are that there has been a steady and definite increase in the prevalence of cancer among the people of the state of Pennsylvania which corresponds very closely to a similar increase registered in world statistics. There is a very much more rapid increase in the death rate among males than among females; and the more general prevalence of the disease, when located in the abdominal cavity, runs a close parallel with this increase. In 1927, in Pennsylvania, cancer was responsible for 20 per cent of all male deaths over 35, and 33 per cent of the corresponding female deaths. The marriage state has apparently no effect on the production of cancer. In 1927, the death rate of single women from cancer of the breast was 118 and of the married, forty-five. The death rate from cancer of the uterus was 103 for the single and seventy-nine for the married. Cancer is the fourth cause of death in Pennsylvania.

Bronchiectasis in Childhood.—Thorpe feels that bronchiectasis is a chronic lung condition which is far more common than is supposed. It is probably due to such conditions as bronchopneumonia, pertussis and measles, aided by accessory sinus disease, which tends to maintain a state of sepsis. The principal symptoms are cough and hemoptysis, and the physical signs are of a protean nature. Renal disease is introduced as a noteworthy complication. Undernutrition, though usually overlooked, is an almost constant feature of this disease. A comprehensive plan of treatment should be adopted for all cases of chronic suppurative bronchitis and bronchiectasis. This plan should include bronchoscopic drainage, postural drainage, adequate nourishing food, cod liver oil, fresh air and heliotherapy. Cough mixtures and inhalations are of no avail and delay the adoption of real therapy. Vaccines prepared from secretions endoscopically removed should be given a thorough trial in advanced cases.

Radiology, St. Paul

12: 1-92 (Jan.) 1929

Lipiodol in Relation to Chest Diagnosis. B. H. Nichols, Cleveland.—p. 1.
Diagnostic Uses of Lipiodol in Paranasal Sinuses. R. H. Fraser, Battle Creek, Mich.—p. 6.
Analgesic Properties of Roentgen Ray. L. J. Carter, Brandon, Man.—p. 27.
Biologic Aspects of Roentgen Therapy. H. Holthusen, Hamburg, Germany.—p. 35.
Comparative Notes on Radon Implants. A. Soiland, W. E. Costolow and O. N. Meland, Los Angeles.—p. 45.
Malignancy of Gastric Ulcer. L. G. Cole, New York.—p. 48.
Erosion of Ribs Due to Stenosis of Isthmus (Coarctation) of Aorta. O. C. Railsback and W. Dock, San Francisco.—p. 58.
Treatment Records. J. F. Herrick, Ottumwa, Iowa.—p. 62.
Modifications of Electroscopic Charging Device. R. B. Taft, Charleston, S. C.—p. 65.
Roentgenologic Diagnosis of Anencephalus. N. J. Nessa, Sioux Falls, S. D.—p. 66.
Demonstration of Therapeutic Methods and Results at Radiumhemmet. G. Forssell, Stockholm, Sweden.—p. 76.

Tennessee State M. Association Journal, Nashville

21: 291-331 (Dec.) 1928

Spinal Cord Tumors. H. J. Hayes and R. E. Semmes, Memphis.—p. 291.
Treatment of Lye Stricture of Esophagus. R. McKinney, Memphis.—p. 300.
Certain Functional Disorders of Colon. S. P. Bailey, Nashville.—p. 302.
Some Common Conditions Seen in Throat by General Practitioner. E. R. Ferguson, Cleveland.—p. 306.

Virginia Medical Monthly, Richmond

55: 597-674 (Dec.) 1928

Management of Essential Features of Impaired Kidney Function. G. Nelson, Richmond.—p. 597.
Case of Bilateral Cystic Kidney. L. T. Price, Richmond.—p. 600.
Tubal Twin Pregnancy: Case. H. E. Jordan and R. H. Meade, University.—p. 605.
Dacryocysitis: Treatment. F. M. Hanger, Staunton.—p. 607.
Heart Pain. F. H. Smith, Abingdon.—p. 611.
Some Problems in Management of Certain Acute Infectious Diseases. J. W. Lindsay, E. C. Rice and M. A. Selinger, Washington, D. C.—p. 616.
Urologic Problems of Childhood. A. I. Dodson, Richmond.—p. 622.
Contraction of Visual Fields Due to Focal Infection: Two Cases. C. P. Jones, Newport News.—p. 627.
Blood Serum Calcium: Its Relation to Disease. C. L. Harrell, Norfolk.—p. 629.
Sarcoma of Choroid. J. N. Greear, Jr., Washington, D. C.—p. 633.
*Multiple Papilloma of Gallbladder: Associated with Duodenal Ulcer. F. Helvestine, Jr., and L. G. Richards, Roanoke.—p. 640.
Tuberculosis in Children. S. Newman, Danville.—p. 642.
Occipitoposterior Position. H. G. Middlekauff, Weyers Cave.—p. 646.
Habits in Children and Their Influence on Behavior. A. Gordon, Philadelphia.—p. 648.
Intravenous Administration of Sodium Iodide in Treatment of Gonorrheal Epididymitis. J. S. Chalmers, Ada, Okla.—p. 652.
Case of Psychic Aphonia. T. E. Oertel, Augusta, Ga.—p. 655.
Pyelitis. R. F. Thornhill, Pulaski.—p. 657.

Multiple Papilloma of Gallbladder and Duodenal Ulcer.—Acid eructations and heartburn after the ingestion of certain articles of food, such as tomatoes and cabbage, were complained of for sixteen years by the patient reported on by Helvestine and Richards. About two and a half years ago, he began to have attacks of pain and soreness in the epigastrium and right upper quadrant of the abdomen. These attacks at this time occurred from every four to six weeks and lasted only for a few hours. The patient did not notice that there was any relation of these attacks to his meals or to the ingestion of any particular kind of food. Eating would sometimes relieve pain, but rest seemed to do the most good. The attacks increased in frequency and severity, and, finally, the patient suffered almost constantly. If the patient worked after meals, the attacks would come on in from thirty to forty minutes. Pain was accompanied by dizziness and at times the patient would faint. Several times during these attacks the patient was jaundiced. Nausea was pronounced, but vomiting occurred only rarely. The patient did not observe any clay colored or tarry stools, and he was not constipated. There was marked tenderness and rigidity over the gallbladder region. Urinalysis was negative. Roentgen examination done previous to admission did not show any abnormalities of the gastro-intestinal tract with the exception of a hyperperistalsis of the stomach. Examination of the gallbladder before ingestion of the dye did not show any pathologic condition, but thirteen hours after ingestion of the usual amount of tetraiodophenolphthalein the gallbladder failed to fill with the dye. With a diagnosis of chronic cholecystitis and a tentative diagnosis of gastric ulcer, the patient was operated on. Seven papillomas were found in the gallbladder and a healed duodenal ulcer. The gallbladder was removed.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

51: 147-284 (June) 1928

Lipodystrophies: Seven Cases. L. H. Ziegler.—p. 147.
Ankle Clonus: Distinction of Organic and Functional Varieties. R. S. Lyman.—p. 168.
Traumatic Aneurysm of Intracranial Portion of Internal Carotid Artery. J. L. Birley.—p. 184.
Central Nervous Control of Micturition. F. J. F. Barrington.—p. 209.
Traumatic Pneumocephalus. A. J. Lewis.—p. 221.
*Changes in Intracranial Pressure During Forced Drainage of Central Nervous System: Hydration Factor. L. S. Kubie.—p. 244.
Clinical Differentiation of Psychogenic and Physiogenic Disorders. R. D. Gillespie.—p. 254.

Changes in Intracranial Pressure During Forced Drainage of Central Nervous System.—Kubie asserts that under narcosis large volumes of hypotonic solutions can be injected into animals without materially raising the venous pressure, if the injections are made slowly. If no escape of cerebrospinal fluid is allowed, the injections give rise to a marked increase in intracranial pressure, and striking hydration of the central nervous system. The hydration is manifested to the naked eye by diffuse swelling of the brain; but sections show the fluid predominantly in certain well defined places, i. e., the ventricles and central canal, the choroid plexus, the perineuronal spaces and the perivascular channels. No recognizable hydration of the neurons themselves occurs, and relatively little diffuse interstitial edema. If free escape of cerebrospinal fluid is allowed, the injections produce little rise in intracranial pressure, and no recognizable hydration of the tissues of the central nervous system; i. e., the ventricles and central canals remain undistended, the choroid plexus is free of vacuoles, and the perineuronal spaces and perivascular channels are not dilated: It is evident, therefore, that lowering the osmotic pressure of the blood by the intravenous administration of hypotonic solutions causes a transudation of fluid from the capillaries into perivascular and perineuronal areas throughout the whole central nervous system; and that by simultaneously draining the cerebrospinal fluid a free escape of this transudate is accomplished from the depths of the tissue to the surface through some pathway of least resistance (presumably the perivascular channels). In this way a washing-out of perivascular exudates into the subarachnoid space was achieved in experimental meningo-encephalitis in cats. The observations suggest the use of forced drainage as a means of treatment of certain infections of the central nervous system in man.

British J. Dermatology and Syphilis, London

40: 483-532 (Dec.) 1928

Staphylococci of Skin. J. F. Smith.—p. 483.
New Finsen Lamp for Local Treatment of Skin. S. Lomholt.—p. 494.
*Bactericidal Properties of Zinc Oxide. H. Haxthausen.—p. 497.

Bactericidal Properties of Zinc Oxide.—Haxthausen is convinced that zinc oxide, applied to the skin, exerts a definite and by no means inconsiderable bactericidal action, in addition to its protective and adsorbent powers. Both as a therapeutic agent in the case of fully developed infections of the skin, and as a prophylactic against secondary infections of various skin diseases, a certain importance must be accredited zinc oxide. The unusual phenomenon that distinguishes its bactericidal action, i. e., its dependence on the presence of acid, gives zinc oxide a peculiar position among the bactericidal substances. While zinc oxide must be regarded as almost neutral as far as the actual cells of the skin are concerned, it will be split up by the acid-producing microbes into disinfectant compounds, so that the microbes, so to speak, weave the rope for their own necks. Its action will thus in some degree be limited to those places where it is needed, and it will be possible to a greater extent than with other disinfectants to injure the bacteria without irritating the skin.

British Medical Journal, London

2: 1121-1162 (Dec. 22) 1928

Pernicious Anemia. J. R. Charles.—p. 1121.
*Id.: With Free Hydrochloric Acid in Gastric Contents: Duodenal Ulcer: Perforation: Operation: Recovery. S. Davidson.—p. 1123.
Chronic Nephritis in Childhood. J. C. Spence.—p. 1124.
Splenomegalic Polycythemia with High Blood Pressure. F. P. Weber, F. J. Barker, F. S. Adams and W. E. C. Dickson.—p. 1129.
Paraphimosis of Clitoris. R. J. Willan.—p. 1130.
Postpartum Anemia. J. A. Powell and J. B. Davey.—p. 1131.
Welsh Physicians and Renaissance. E. R. Williams.—p. 1133.
Retropharyngeal Abscess Secondary to Foreign Body in Hypopharynx. D. L. Sewell.—p. 1135.
Local Asphyxia in Young Child. F. F. Wheeler.—p. 1135.
Self-Reduced Dislocation of Fibula. L. R. Lempriere.—p. 1136.
Treatment of Varicose Ulceration. A. P. Luff.—p. 1144.

Pernicious Anemia Associated with Duodenal Ulcer.—Davidson's patient gave a long history of epigastric pain but consistently stated that he was not affected by the taking of food, although he was suffering from duodenal ulcer. The presence of marked megalocytosis and anisocytosis, a color index over unity, and a van den Bergh reaction characteristic of hemolytic jaundice were all classic signs of pernicious anemia. On the other hand, the presence of free hydrochloric acid in the stomach and the absence of leukopenia contraindicated the diagnosis. Davidson's first visual impression of the patient was of a small, badly developed, emaciated, haggard man, who was probably suffering from a simple or malignant ulcer of the stomach. He was suddenly seized with an acute pain in the right epigastrium, accompanied by profuse sweating and boardlike rigidity of the abdominal muscles. The condition was diagnosed as a perforated duodenal ulcer, and operation disclosed a perforation in the anterior wall of the duodenum. The stomach, gallbladder, liver and appendix were perfectly normal. The spleen was enlarged. A posterior gastroenterostomy was performed and the patient made a perfect recovery. He was placed on a light diet and given alkalis and liver by mouth. Following this treatment, the gastric pain disappeared and the patient put on weight rapidly. The symptoms and signs of anemia quickly disappeared.

2: 1163-1202 (Dec. 29) 1928

*Diagnosis of Cancer of Stomach. W. Gordon.—p. 1163.
Scope of Cesarean Section: Analysis of 295 Cases of Classic Operation. F. Ivens.—p. 1166.
*Sarcoma of Small Intestine: Three Cases. P. J. Moir and G. F. Walker.—p. 1170.
Epithelioma, Erythema Induratum and Ultraviolet Radiation. J. G. Tomkinson.—p. 1171.
Pulmonary Actinomycosis: Two Cases. T. W. Preston.—p. 1172.
Temperature in Pulmonary Tuberculosis. C. Milne.—p. 1173.
*Cutaneous Allergy Following Diphtheria Anatoxin Administration. A. Compton.—p. 1175.
Generalized Meningococcus Infection. A. W. Gardiner.—p. 1176.
Status Lymphaticus. J. Gilchrist.—p. 1177.
Rat Bite Fever in Hong-Kong. G. E. Aubrey.—p. 1177.
History and Lore of Cinchona. C. J. S. Thompson.—p. 1188.

Diagnosis of Cancer of Stomach.—Gordon again calls attention to the so-called cardiac sign, first described by him in 1903. He says that it is almost pathognomonic of carcinoma. The only other conditions capable of producing it besides carcinoma are (1) starvation and (2) severe diarrhea. The sign consists of a remarkable diminution, which may go on to complete disappearance, of the deep cardiac dulness in the recumbent posture when there is nothing else to account for it. When the question of carcinoma of some internal organ has arisen, if the recumbent cardiac dulness measures only 1½ inches or less across instead of the normal 3 to 3½ inches—it is often reduced to the size of a postage stamp—in the absence of true emphysema as shown by good chest expansion, or of any other chest disease that could either draw the heart backward or cover it with lung, the odds in favor of the existence of cancer are about 4 to 1; if the recumbent cardiac dulness is of normal width in the absence of cardiac enlargement or of any chest condition that could either hold the heart forward or retract the lung, the odds are about 4 to 1 against cancer being present. This sign is commonly accompanied by a remarkably feeble pulse and feeble heart sounds.

Sarcoma of Small Intestine.—In the first case reported by Moir and Walker, the tumor was situated about 18 inches below the duodenojejunal junction. The mass was adherent to the large bowel, but it was freed without much difficulty, and the whole mass, with the adjacent glands and about 2 feet of intestine, was resected. A lateral anastomosis was done. The patient was quite well for eleven years. Then she was again admitted for colic, abdominal pain and vomiting of several months' duration. At operation an annular cufflike growth was found high up in the small intestine. This was resected, together with the adjacent glands. Histologically it showed a sarcomatous structure identical with the tumor removed in 1913. In 1928 the patient reported herself quite well. In the second case a mass resembling a sloughing cyst was found attached to the small intestine about 1 foot from the duodenojejunal junction. A wide resection and a lateral anastomosis was performed. Histologically the mass proved to be a spindle cell sarcoma. One year after the operation the patient reported himself as quite well. The third patient was admitted on account of acute intestinal obstruction of very sudden onset. No definite antecedent illness could be ascertained apart from two attacks of diarrhea within the last few months. When first seen the patient was in very poor condition, but it was decided to give him the chance of a laparotomy. A small intestinal tumor was seen, but all that could be done was an ileostomy. At the postmortem examination the distention of the small intestine was found to be relieved, but an early acute general peritonitis was the cause of death. About 8 feet from the ileocecal valve a rhomboidal fleshy mass was found adherent to the small intestine. It dangled from a small base and a pedicle containing some large veins. It had caused acute intestinal obstruction by bringing about torsion of the coil to which it was attached. Histologically the structure was leiomyosarcoma.

Cutaneous Allergy Following Administration of Diphtheria Anatoxin.—A case is reported—the first of its kind known to Compton—of allergic symptoms arising in connection with the use of anatoxin in diphtheria prophylaxis. The patient had received three prophylactic injections of diphtheria anatoxin subcutaneously. A thirteen day interval separated the first and second injections, a sixteen day interval the second and third. The doses given were 0.4, 0.8 and 0.8 cc., respectively. Apart from the usual local redness at the site of inoculation, no reaction accompanied the first two injections. On the evening of the third day after the last injection (that is, thirty-two days from the beginning), the patient felt slightly out of sorts and retired early. The next morning she awoke with a swollen puffy face, and while attempting to dress she noticed that suddenly "everything went dark." She was put back to bed, and when she was seen shortly afterward the eyelids were found to be markedly edematous, and there was a widespread urticarial eruption present over the body, especially noticeable on the legs, thighs and chest, attended by itching. The temperature was 99 F., the pulse 80. The urine was normal. After two days in bed, with mild purgation and a light diet, the attack completely passed; the eruption lasted from thirty-six to forty-eight hours. During the subsequent two months it has not recurred.

Glasgow Medical Journal

110: 329-388 (Dec.) 1928

Clinical Features of Occlusion of Coronary Arteries. G. A. Allan.—p. 329.
*Rupture of Heart from Pyemic Abscess in Myocardium. G. H. Stevenson and A. J. Marshall.—p. 337.
Concealed Tuberculosis. J. Crocket.—p. 341.
Seventeenth Century Collection of Remedies. J. F. Smith.—p. 348.
Case Presenting Multiple Arterial Thrombosis Including Both Coronaries. G. A. Allan.—p. 351.
Case of Tetanus Neonatorum: Recovery. J. M. Johnston.—p. 354.

Rupture of Heart from Pyemic Abscess in Myocardium.—Following a stone bruise of the ankle, a boy, aged 9 years, developed a septicemia. Free incisions were made into the cellulitic area over the fibula. The subcutaneous tissues were found to be infiltrated with thin, watery pus which was clinically streptococcal in type. The periosteum over the fibula was not raised or much inflamed, and there was no evidence of osteomyelitis of this bone. The septic blisters were cauterized and the foot was dressed with acriflavine. Antistreptococcal serum was administered subcutaneously on account of the clinical signs present, although Stevenson and Marshall later discovered this to be a mistaken procedure. During the days following the operation the boy developed numerous small

swellings in various situations, notably in the abdominal wall and the parotid regions. Only one of these actually became an abscess and required incision—that in the left parotid region. All the others aborted and disappeared. On the fifteenth day, the temperature had dropped to normal, but the pulse was 120. The nurse in charge went in to ask the patient what he wished for his breakfast, and was informed that he wanted an egg. On returning with this a few minutes later she found that he was dead, death having been practically instantaneous. At the necropsy it was discovered that the sudden death in this case was definitely due to rupture of the heart caused by a pyemic abscess in the wall of the left ventricle.

Lancet, London

2: 1277-1292 (Dec. 22) 1928

Certain Visceral Sensations. E. P. Poulton.—p. 1277.
Some Aspects of Dental Sepsis: Focal and Residual. T. Nuthall.—p. 1285.
Abdominal Pain in Pregnancy. C. S. Lane-Roberts.—p. 1288.
Instruments Useful in Nontouch Technic of Surgery. R. L. Spittel.—p. 1290.
*Human Infestation with Liver Fluke. S. W. Patterson.—p. 1291.
*Rupture of Esophagus by Indirect Violence. J. R. Murdoch.—p. 1292.

Human Infestation with Liver Fluke.—In man the liver fluke *(Fasciola hepatica)* is a rare parasite, only twenty-eight cases of infestation having been recorded in the literature up to 1915. The early cases were discovered at autopsy. Of the sixteen cases reported up to 1902, jaundice occurred in only three. In Patterson's case the illness started in the beginning of November, 1927, with chills and mild rigors; the temperature, normal in the morning, would rise to from 102 to 103 F. at night followed by sweating. In addition to general malaise, there was an uncomfortable feeling in the upper abdomen, not related to food, and an irritating spasmodic cough which sometimes brought on vomiting. Ordinary physical examination did not reveal anything abnormal; but the blood showed a leukocytosis of 14,700, of which 6,200 (42 per cent) were eosinophils. Roentgen examination was negative. The watery stools after magnesium sulphate contained numerous ova of *F. hepatica*. The treatment adopted was nonsurgical biliary drainage by drachm doses of 50 per cent, magnesium sulphate twice a week on an empty stomach, increasing doses of methenamine with sodium bicarbonate and intravenous injections of a preparation of antimony and potassium tartrate. The abdominal symptoms disappeared, and the patient is well.

Rupture of Esophagus by Indirect Violence.—Murdoch records the case of a boy, aged 6 years, who was knocked down and run over by a motorcycle. When seen on admission he was unconscious, with hemorrhage from the nose and mouth. He died a few hours after admission. Postmortem examination revealed marked bruising of the left side of the chest wall and over the left hip joint, extensive bruising of the scalp on the left side and a comminuted fracture of the left humerus. The heart, larynx and trachea were normal. The left pleural cavity was partially filled with dark reddish brown fluid containing small particles of food. The base of the left lung was collapsed and very congested. No ribs were fractured, and the right pleural cavity and lung were normal. A longitudinal tear was found on the left side of the esophagus three-fourths inch above the diaphragm and 1¼ inches long. There was also a slight rupture of the diaphragm around the esophageal opening. The esophageal wall was extremely thin. The abdominal organs were all normal without any signs of injury. A large fracture of the skull was found running from the vault on the left side down into the left middle fossa, and there was an extensive extradural hemorrhage on the left side.

Practitioner, London

121: 341-393 (Dec.) 1928

Functional Diseases of Heart. T. J. Horder.—p. 341.
Cure of Varicose Veins and Their Sequelae. S. Alexander.—p. 353.
*On Clothes. L. Hill.—p. 359.
*Rumination (Merycism) in Infants. D. Paterson.—p. 380.
Medical Emergencies in Childhood. J. C. Spence.—p. 384.
*Diet in Infective Arthritis. V. Coates.—p. 391.

Man Wears Too Much Clothing.—Hill feels that too much clothing is worn by civilized man. He says that in winter a man carries a tenth of his weight in clothes, while a dog carries only 2 per cent in his fur. A woman in modern dress carries only half or less the weight that a man does, and there is no evidence that she suffers in health from discarding that excess which the Victorian women wore—in fact, she has gained. It is absurd to put on an overcoat when going out for a walk. It is good to go out and be braced by feeling cold and so be impelled to take vigorous exercise. It is only the old, the underfed and the feeble who require very warm clothing, those whose fire of life is weak and cannot be fanned by vigorous exercise. Those, too, in a state of shock from injury, those anesthetized and the paralyzed who have lost the power of heat regulation require careful clothing and warmth. Clothes need to be not only as light as possible but permeable to air, allowing free evaporation, becoming to the least degree wet with sweat and not clinging to the skin when wet. The cellular structure produced by weaving, whether of wool, cotton, linen or silk, secures conditions that give warmth, softness, compressibility and elasticity, permeability and evaporative power. Smooth, closely woven and glazed materials are unsuitable, except as a protection from the sun, e. g., the pith helmet or flowing robe of the Arab. The winter and summer pelts of domestic animals, such as the horse and the cow, show the small extra amount needed to face the open-air life and the winds of winter. Thick undervests and heavy overcoats and furs are needed not by citizens but by arctic travelers and soldiers standing in freezing trenches. The Victorians were all wrong in their fear of cold, coddling in shut-up, heated rooms, with sand bags to keep air from entering by the cracks of doors and windows, wearing heavy clothing and fearful of going out in night air or rain. The better health and longer life of open-air workers, those most exposed, such as shepherds, fishermen and agricultural laborers, as compared with city folk, and the success, too, of the open-air treatment of tuberculous patients and weakly children, has shown the absurdity of such views. Girls have become much more healthy and vigorous through the freedom from a coddled and restricted life. Good appetite and digestion, prevention of constipation, good health of the respiratory organs, nervous vigor, good looks and happiness depend very largely on the deep breathing, heightened circulation and proper utilization of the food eaten which result from exposure to cold and exercise. By the taking off of clothes and by fan ventilation work can be carried out even in warm factories and climates without excessive call on the sweat mechanism, and the heart saved from the fatigue of pumping much blood through the skin to cool the body. It is most important for the performance of efficient and economic work that such a simple means of cooling should be used. Fashion and custom should not prevent people from taking off outer garments when feeling too warm. On hot summer days, workers in offices, shops and factories should be encouraged to take off excessive clothing and work in shirt sleeves or light overalls. By nakedness not only is the loss of heat by convection and evaporation made easy, but also loss by radiation to cooler surroundings. If the sun shines on the naked body, there is a gain of much radiant heat, while the action of visible and ultraviolet rays on the skin is obtained. People in all classes overclothe children and confine them far too much in hot, stuffy rooms. A safeguard of the health of the poor is playing in the street; mistaken philanthropy has striven to turn them into playrooms. Babies are not delicate, but are able to withstand exposure to cold just as a naked pigling stands it, nestling among its fellows and against its mother, but exposed to the open air. Through some hundred thousand years wild men have withstood exposure before clothes were invented, and there are wild men who still withstand it naked. The baby is born with the power to withstand the environment, whether it is the child of a savage or of a citizen. A few score years of sheltered civilized life have not changed this inherent power. Babies that are well fed, and given exposure to open air and sun, naked, with plenty of kicking and crawling exercise, long sleeps out of doors, and light clothing, grow up virile, with strong muscle and firm bones. Convention keeps children hatted and clothed, and pride of race makes mothers thus preserve their whiteness. They should wear only a loincloth, tan in the sun, be in and out of water, and live open-air lives. In hot climates proteins should be reduced and carbohydrates increased; on the other hand, when there is great exposure to cold, more meat is required. In

tropical climates, fruits, salads, green vegetables, rice, and a little fish, bird and dairy produce afford the best diet. In the arctic regions meat and fat form the larger part of the ration.

Rumination in Infants.—Paterson is of the opinion that no condition goes unrecognized more often than that of rumination, nor is there any condition which responds more readily to careful treatment. An occasional gastric lavage is a very great help, and although this is not essential it seems to have a most beneficial influence on the infant. The best treatment consists in thickening the feeds with some starchy food. A cereal should be slowly thickened until it is like moderately thick porridge, and it can then be added to a cow's milk-and-water feed or to the feed that the child is already having. The rationale of this is dependent on two facts: first, that it is more difficult to vomit a thick substance than a thin substance, and second, that by raising the caloric intake, even if some of the feed should be vomited, the high caloried remainder is probably sufficient to make the child thrive.

Diet in Infective Arthritis.—Coates says that there is no standard diet for chronic infective arthritis. At different stages of the disease different diets may be called for. Generous protein is allowed and even advisable provided the protein metabolism and renal efficiency are intact, as evidenced by biochemical examination. Carbohydrate intake may be normal or even increased in emaciated subjects when given with insulin, but it should be reduced in the obese if the carbohydrate mechanism is at fault as proved by the dextrose tolerance or basal metabolic rate tests. Fat in normal or increased quantities is indicated in the atrophic forms of arthritis unless there is a biliary intolerance, mucous colitis or abnormal content in the stools.

Archives des Maladies de l'App. Digestif, etc., Paris

18: 961-1080 (Nov.) 1928

Diseases of Gallbladder and of Bile Ducts. A. J. Bengolea and C. Velasco Suarez.—p. 961.
*Action of Some Medicaments on Esophagus. P. Guns.—p. 1021.

Action of Some Medicaments on the Esophagus.—In Guns' experiments on the esophagus of normal persons, 0.001 Gm. of atropine sulphate, 0.01 Gm. of pilocarpine hydrochloride, 0.001 Gm. of epinephrine, 0.05 Gm. of papaverine hydrochloride and ergotamine were given subcutaneously. Thirty minutes later the patients received some barium in capsules and were submitted to a fluoroscopic examination. The progress of the barium capsule in the esophagus was slowed by atropine from five or six seconds to fifteen or twenty seconds, and was sometimes interrupted for a few seconds behind the aorta and at the cardia. Pilocarpine had just the opposite action. Papaverine produced powerful antiperistaltic movements; epinephrine and ergotamine had no effect.

Bulletin Médical, Paris

42: 1277-1304 (Nov. 21-24) 1928

*Pseudosyringomyelitic Aspect of Foot in Tabes Dorsalis: Two Cases. T. Alajouanine, M. Bascourret and M. Gopcevitch.—p. 1283.
Posttraumatic Cerebral Abscesses. T. Alajouanine and D. Petit-Dutaillis.—p. 1288.
*Acute Curable Form of Tabetic Ataxia. J. Decourt.—p. 1292.
Cerebrospinal Cysticercosis. P. Schmite.—p. 1294.

Pseudosyringomyelitic Aspect of Foot in Tabes Dorsalis.—Alajouanine et al. report two cases of an unusual manifestation of tabes dorsalis. They observed, as the first symptom in latent forms of tabes dorsalis in which the cerebrospinal fluid was negative, a slow but steady development of superficial and deep trophic disturbances on one or both feet. There were also sensory and sympathetic disorders, analogous to the syringomyelitic hand disorders, but quite different from tabetic arthropathy. To such a form of tabetic arthropathy they propose to give the name pseudosyringomyelitic foot.

Acute Curable Form of Tabetic Ataxia.—Decourt calls attention to certain forms of ataxia in latent tabes spinalis. These forms appear usually in patients who seem to be healthy, but who, in a few hours, develop all the signs of typical locomotor ataxia, the only difference being that the deep sensibility is not altered. The Wassermann test is not always positive, but there are pupillary tabetic signs and an absence of tendon reflexes. The cerebrospinal fluid reveals lymphocytosis hyperalbuminosis and a positive benzoin test. With energetic bismuth, iodine and mercury treatment (no arsenicals), a cure is obtained in several months.

Bulletins et Mém. de la Soc. Nat. de Chirurgie, Paris

45: 1089-1119 (Nov. 3) 1928

*Operation for Perforated Peptic Ulcer in a Meckel's Diverticulum. Hartglass.—p. 1091.
*Ischemic Myositis Cured by Early Aponeurotomy. P. Moulonguet and J. Senèque.—p. 1094.
*Diffuse Aneurysm of Popliteal Artery Caused by an Exostosis on Femur and Cured by Arterial Suture. Boppe.—p. 1097.
Cancer of Floor of Mouth. R. Bernard.—p. 1101.
Traumatic Spondylosis. Ody.—p. 1106.
Bone Graft in Transcervical Fractures of Neck of Femur. C. Dujarier. —p. 1115.
Giant Meckel's Diverticulum. L. Grimault.—p. 1117.

Perforated Peptic Ulcer in a Meckel's Diverticulum.—Hartglass reports a case of diffuse peritonitis due to the perforation of a Meckel's diverticulum of the ileum. Microscopic examination of the diverticulum revealed the presence of a large heterotopic island of hyperplastic gastric mucosa in the midst of the intestinal mucosa of the diverticulum. The author believes that the peptic activity of this gastric mucosa caused the ulcer by autodigestion. He refers to similar cases studied by Humbert, in all of which intestinal hemorrhages or peritonitis followed perforation, and suggests careful exploration of the terminal portion of the ileum for possible perforated Meckel's diverticulum in all operations for intestinal hemorrhages of obscure origin or for peritonitis following perforation.

Ischemic Myositis Cured by Early Aponeurotomy.—Moulonguet and Senèque report a case of incipient ischemic myositis in a boy, aged 17, who had fallen from a bicycle, striking the left elbow. There was a diffuse ecchymosis and a considerable tense swelling of the forearm; the fingers were semiflexed and the patient screamed when attempts were made to move them. The roentgenograms were negative. After free incision of the aponeurosis on the anterior aspect of the forearm to liberate the muscles from compression by the intramuscular hematoma, relief was almost instantaneous and in six days the patient was able to resume his work.

Diffuse Aneurysm of Popliteal Artery Caused by an Exostosis on the Femur and Cured by Lateral Arterial Suture.—In a case of large aneurysm of the popliteal artery caused by laceration of the wall of the vessel by an exostosis on the femur, Boppe exposed the artery and sutured the arterial wound with silk. Recovery was prompt and without any accidents.

Presse Médicale, Paris

36: 1489-1512 (Nov. 24) 1928

*Perienterocolitis and Intestinal Occlusion. F. Trémolières and J. Marceau.—p. 1489.
Cerebrospinal Fluid After Spinal Anesthesia. P. Stéphanovitch.—p. 1492.
*Metallic Screw for Marking Vertebrae. J. Calvé.—p. 1493.
*Position of Arm in Intravenous Injections. C. Mantoux.—p. 1493.

Perienterocolitis and Acute Intestinal Occlusions.—Trémolières and Marceau attempt to establish the fact that adhesive peritonitis around the small intestines and colon, extending from the duodenojejunal flexure down to the sigmoid, is a separate pathologic entity. These adhesions are seldom primary; they are usually infectious or traumatic (surgical) in origin. The symptomatology is rather obscure: habitual constipation; abdominal pains, especially in the right iliac fossa; different reflex troubles, and toxic, nervous, digestive and endocrine disturbances. Finally the adhesions produce a complete intestinal occlusion by strangulation by bands or angulation or adhesion of the intestine. In both incomplete and complete intestinal occlusion one should always suspect perienterocolitis, particularly when the history reveals some abdominal operation, or such diseases as appendicitis, pericholecystitis and typhoid ulcerations. Surgical intervention is imperative, but after the operation the reformation of adhesions must be prevented by submitting the patient to a prolonged treatment with a suitable regimen of vaccine therapy, diathermy, hydrotherapy and abdominal gymnastics.

A New Method of Marking Vertebrae by Introducing Subcutaneously a Metallic Screw Into the Spinous Process.—To mark diseased vertebrae for surgical interven-

tion Calvé proposes, instead of skin marks that may disappear during the preparation of the operative field, that a small metal screw be introduced into the spinous process of the diseased vertebra. The procedure is simplified by the use of a trocar-like instrument devised by him.

Position of Arm in Making Intravenous Injections.—To facilitate the flow of the blood into the syringe in the beginning of an intravenous injection, Mantoux advises that the arm of the patient be permitted to hang by his side. Then the needle will be directed obliquely from below upward, the bottom of the syringe will be below the point of puncture of the vein, and the force of gravity will favor the flow of the blood.

36: 1529-1544 (Dec. 1) 1928

Alkalosis and Alkaline Diathesis. R. Goiffon.—p. 1529.
General Anesthesia with Ethyl Chloride. E. Caillaud.—p. 1531.
*Late Heredosyphilis of Cerebrospinal Nervous System. M. Faure-Beaulieu.—p. 1539.
*Artichoke Leaves in Treatment of Liver Diseases. H. Leclerc.—p. 1540.

Late Manifestations of Hereditary Syphilis of Cerebrospinal Nervous System.—Faure-Beaulieu calls attention to the possibility of late manifestations of hereditary syphilis. He reports the case of a woman, whose father was syphilitic and whose brother had an early heredosyphilis, who developed the first signs of slowly progressing pyramidal sclerosis with some slight meningeal manifestations at the age of 33. The initial symptoms were root pains in the right side of the thorax and slight disturbances in gait, accompanied by a foot clonus on the right side. In the course of sixteen months cephalalgia, vertigo, slight visual disturbances and paresthesia appeared, together with exaggeration of the Babinski and patellar reflexes on the side of the foot clonus and disappearance of the abdominal reflexes. Optic neuritis, without stasis, was found on ophthalmologic examination; lymphocytosis and increased albumin and globulin were found in the cerebrospinal fluid. The Wassermann reaction was negative.

Artichoke Leaves in the Treatment of Liver Diseases.—Leclerc calls attention to a report made by Brel and Rosa, who treated sixty cases of hepatic cirrhosis, hepatic insufficiency, biliary lithiasis and cholecystitis with aqueous and alcoholic extracts of the leaves of artichokes, and in all cases observed a considerable amelioration of the symptoms, with regulation of intestinal function, increased diuresis and disappearance of the discolored stools and of the biliary pigments from the urine. Leclerc treated one case himself and obtained similar results.

36: 1561-1576 (Dec. 8) 1928

Acetylcholine in Treatment of Sweats of Tuberculous Patients. M. Villaret and R. Even.—p. 1561.
Value of Serologic Reactions in Syphilis. C. Flandin.—p. 1561.
*Splenic Opotherapy in Tuberculosis. Bayle.—p. 1563.

Splenic Opotherapy in Tuberculosis.—Bayle administered whole pig spleen extract hypodermically in grave cases of tuberculosis with a fatal prognosis, in which all kinds of treatment, including pneumothorax and antigens, had proved ineffective or were contraindicated. In all cases he observed increase in the number of erythrocytes, in the hemoglobin percentage and in the weight; diminution or complete cessation of the cough, the expectoration and the fever; regression, often to the point of complete cicatrization, of the lesions, and diminution or disappearance of the tubercle bacilli in the sputum. Bayle thinks that, although unspecific, this treatment should have a place in tuberculosis therapy, since it is inoffensive, and always ameliorates the general condition of the patients and increases the defensive powers of the organism, thus favoring the cicatrization of the lesion and the disappearance of the bacilli.

36: 1577-1592 (Dec. 12) 1928

*Extirpation of Superior Cervical Ganglion in Diabetes Insipidus. R. Leriche and R. Fontaine.—p. 1577.
Hematogenic Cystitis. Desmoulins, Misrachi and Simard.—p. 1578.
*Arterial Blood Pressure and Tuberculosis. C. Glaros.—p. 1579.

Effect of Extirpation of Superior Cervical Sympathetic Ganglion on Traumatic Diabetes Insipidus.—From their study of several cases of extirpation of the superior cervical ganglion, both in persons with normal metabolism and in persons with diabetes insipidus, Leriche and Fontaine conclude that this operation does not produce any changes in the water metabolism of persons with normal metabolism, but does exert a marked diuretic action in persons with diabetes insipidus.

Arterial Blood Pressure and Tuberculosis.—Glaros studied the blood pressure of 100 patients with pulmonary tuberculosis. It was found to be normal in all afebrile patients in good general condition, even in those with cavity formation. There was one case of arterial hypertension in a man, aged 45. Hypotension usually was due to fever, fatigue, cachexia or to exacerbations of the process in the evolution of the disease. Persistent hypotension was always of bad prognostic import. Neither artificial pneumothorax nor exudative pleurisy had any influence on the blood pressure.

Clinica Pediatrica, Modena

10: 665-766 (Nov.) 1928

*Modifications in Reactions of Organic Fluids as a Result of Insulin Therapy. G. Roi.—p. 665.
Modifications of Arneth's Formula in Gastro-Intestinal Disorders of Infants. A. Macchi.—p. 680.
Autoserotherapy by the Gilbert Method in Treatment of Serofibrinous Pleuritis and Peritonitis of Children. M. Giuffrè.—p. 701.
*Influence of Malaria on Morphologic Development of Child. G. A. Piana.—p. 732.

Modifications in the Reactions of Organic Fluids as a Result of Insulin Therapy.—From his experiments Roi draws these conclusions: In atrophy and in rickets, there is always a disturbance of the acid-base equilibrium of the organism. The disequilibrium is manifested through lowering of the alkali reserve or the hydrogen ion concentration of the blood. The degree of the lowering corresponds in general to the gravity of the clinical symptoms. The lowering of the alkali reserve is a constant condition, while the lowering of the hydrogen ion concentration is observed only in the more grave types. The hydrogen ion concentration of the urine has no significance when the determinations are made only occasionally, but the determination of the elimination of ammonia in the urine throws considerable light on the defense forces of the organism. The determination of the hydrogen ion concentration of the spinal fluid shows that it does not undergo noteworthy changes. A tendency to restore the acid-base equilibrium is an indication of an improvement in the clinical condition. Acidosis in a child tends to maintain and aggravate the athreptic state. In rickets, the state of acidosis may be regarded as the most important pathogenic factor in continuing the altered exchange of calcium salts. Insulin therapy, when opportunely applied, constitutes the best form of treatment in such dystrophic states. In the atrophic subject, it tends to improve the state of nutrition and to eliminate all those symptoms that are associated with the acidotic state of the blood, and in the rachitic subject it aids in the fixation of calcium by the bone tissues and changes the reaction of the colloidal protein, thus eliminating the state of acidosis in the rachitic organism, which not only hampers the deposition of calcium salts but tends to bring about the decalcification of the bone tissue already formed.

Influence of Malaria on the Morphologic Development of Child.—Piana brings out that the malarial process causes changes in physical development that are exceedingly important, since they tend toward the creation of a constitutional habitus of a type that favors the evolution of lung disease. There tends to be a deficient development of the trunk, and especially the thorax, as compared with the limbs and the head. The author found the most marked changes in those children in whom the malarial process exerted its action in early infancy. At the basis of these changes are profound alterations of metabolism and of the endocrine glands.

Pediatria, Naples

36: 1193-1248 (Nov. 15) 1928

*Eutrophic Action of Irradiated Foods. L. Spolverini.—p. 1193.
Behavior of Glycemic Curve in Undernourished Children Subjected to Insulin Treatment. G. Vitetti.—p. 1210.
Total Inversion of the Viscera. G. Ganelli.—p. 1220.
Diplococcus Septicemia in Infant. E. Schwarz.—p. 1231.

Eutrophic Action of Irradiated Foods.—Spolverini found it possible, by means of ultraviolet irradiation, to give eutrophic properties to fresh raw wheat flour and to olive oil, as was shown by an improvement in the weight and development of the animals to which they were fed. Under like experimental

conditions, the beneficial action that olive oil may exert on the organism is constantly and sensibly greater than that of wheat flour or of cow's milk. The action of the eutrophic potency acquired by the food substance results from multiple factors, among which may be mentioned particularly: (1) age of the subject; (2) the irradiation dose; (3) the quantity ingested, and (4) the conditions of alimentary equilibrium among the various components of the food eaten. Eutrophic potency not only may be annulled but may become actually harmful. Other things being equal, in order to confer such activating properties by means of ultraviolet rays, a much higher irradiation dose is needed for wheat flour than for olive oil. In order to acquire such properties, a substance must be in its natural state and not too old.

Policlinico, Rome

35: 2319-2378 (Nov. 26) 1928. Practical Section

Survival of Leukocytes in Pus. S. Francesco.—p. 2319.
*Traumatic Cyst of Vagina. A. Stux.—p. 2322.

Traumatic Cyst of Vagina.—Stux reports the case of a woman, aged 34, who complained of pain in the sacral region, and frequent urination. This condition had lasted two years and during this time she had been treated conservatively without result. In examining the patient the author was surprised to find, in addition to a relatively small, completely healed tear in the perineum, something which looked like a rectocele in the vagina; this was in reality an elastic and translucent cyst the size of a pigeon's egg. Since the disturbances of the patient seemed to be due to this cyst, operation was advised. The cyst was completely removed by Martin's method. Speaking of the etiology of these cysts, Stux says that epithelial cells set free by a trauma may be responsible. Histologically this has been proved to be the case. The inner wall of the cyst is lined with striated epithelium identical with that of the vagina. Therefore, the formation of a cyst at the site of a vaginal rupture must be considered to be traumatic in origin. In the case cited, the cyst developed after childbirth; hence it can be regarded as a consequence of a birth trauma.

Medicina Ibera, Madrid

2: 561-592 (Dec. 8) 1928. Partial Index

*Treatment of Fever in Pulmonary Tuberculosis. E. García del Real, Jr.—p. 565.

Treatment of Fever in Pulmonary Tuberculosis.—In the treatment of pulmonary tuberculosis García del Real divides the patients into three groups: bedridden patients with fever, ambulatory patients with fever, and afebrile patients. In some cases in the afebrile group, carefully supervised exercise may be tried; but, generally speaking, if the fever abates following the administration of antipyretics, exercise should not be permitted. In a smaller number of cases in the afebrile group antituberculous treatment, preferably the percutaneous administration of tuberculin or chemotherapy, should be tried. Ambulatory patients with fever react well to rest cures. For patients who continue to be febrile in spite of rest, sanatorium treatment is advisable, sometimes combined with the administration of calcium and sometimes combined with surgery. Of the antipyretics, amidopyrine is of value. It may be given in doses of from 0.15 to 0.30 Gm.

Revista Española de Medicina y Cirugía, Barcelona

11: 725-792 (Dec.) 1928. Partial Index

*New Form of Progressive Muscular Dystrophy. J. M. Villacián.—p. 727.

New Form of Progressive Muscular Dystrophy.—Villacián observed a new form of progressive muscular dystrophy in two brothers. The heredofamilial nature of the primary myopathy in these cases was evident. In the same family, out of fourteen persons over 40, nine had had or still had the disease. The age of onset varies from 40 to 45. Its evolution is progressive and it results in death in from ten to fifteen years. The motor deficiency and the atrophy begin in the extremities, almost simultaneously in the arms and the legs. The muscles of the head, tongue and neck are not involved. At first there are painful cramps, followed by stiffness, rendering rapid flexion impossible. The author's patients were syphilitic. They did not exhibit symptoms of endocrine disturbance; opotherapy did not give any results.

Archiv für Kinderheilkunde, Stuttgart

85: 161-320 (Nov. 27) 1928

*Congenital Myatonia. G. Katz.—p. 161.
Roentgen Diagnosis of Bronchotetany. O. Göttche.—p. 185.
Energy Quotients of Breast-Fed Children in Hospital. U. Neumann.—p. 194.
Desquamative Erythrodermia and Exsudative Diathesis. M. Ruthardt.—p. 221.
Casuistics of Purpura Fulminans. K. Boettiger.—p. 239.
Rôle of Phosphorus in Phosphorus Cod Liver Oil. M. Haase-Koeppe.—p. 257.

Congenital Myatonia: A Heredodegenerative Disease.—Katz considers the name of the disease inappropriate and would prefer to term it congenital muscular atrophy. The author gives the case reports of two baby brothers with this disease. This observation is very important, since Oppenheim's disease has not been considered as hereditary. He asserts that in most cases the disease may be traced and proved to be present in several members of the same family. Clinical and pathologic-anatomic investigations of these two cases and a study of the literature convinced the author that congenital myatonia should be considered a heredodegenerative disease of the central nervous system. The cause is not yet known, but the disease originates in an atrophy of the nerve tracts, determined in the germ plasm. Toxic, metabolic and infectious influences may result in atrophy, degeneration and absorption of the anterior cornu cells, the peripheral nerves and the nerve endings. Abiotrophy in the segments of the trophic nerve tracts varies in individual cases and is sometimes more spinal in the anterior cornu cell, sometimes more peripheral in the nerves, and sometimes in the nerve endings. The prognosis varies according to the degree and extent of the disturbances and degenerations. In cases of extensive congenital myatrophy it is unfavorable and death occurs generally in the first or second year, from respiratory disease. Even in more benign cases of myatonia improvement is rare, while recovery has never been reported. Therapy consists primarily in preventive measures against infections of the respiratory tract; all disturbing influences should be kept away from the patient.

Deutsche Zeitschrift für Chirurgie, Leipzig

212: 153-288 (Nov.) 1928

Healing Art, Especially Surgery, in Ancient Greece. Hagedorn.—p. 153.
*Postoperative Behavior of Thrombocytes; Their Relation to Postoperative Thrombosis. E. Normann.—p. 166.
Ombrédanne's Method of Ether Anesthesia. I. Wymer.—p. 179.
Endopleural Lesions Resulting from Trauma of Thorax. R. Nissen.—p. 186.
*Experimental Pneumothorax: II. Causes of Increased Venous Pressure. H. Tsunoda.—p. 198.
*Hyperglycemia in Acute Diseases of Pancreas. F. Bernhard.—p. 209.
*Clinical and Experimental Study of Cholemic Hemorrhages (Cholemic, Hemorrhagic Diathesis). S. Soejima.—p. 217.
Resection of Carcinoma of Rectum. K. Stöger.—p. 232.
*Sphincteroplasty of Rectum, Experimental and Clinical Principles of Sphincter Formation Following Insertion of Hard Rubber Rings. H. Matti.—p. 236.
Behavior of Intervertebral Disks in Cases of Fracture and Tuberculosis of Vertebrae. P. Rostock.—p. 261.
*Synovial Osteochondromatosis and Trauma. F. Böhm.—p. 275.

Postoperative Behavior of Thrombocytes.—In sixty surgical cases, Normann studied the behavior of the thrombocytes after operation for from one to three weeks. He was able to construct a definite curve. In cases without complications the number of thrombocytes always increased slowly but steadily to a maximum and then just as slowly diminished until the norm was reached. The peak of the curve varied considerably but stood in some relationship to the type and extent of the operation. At any rate, the operation was the cause of the thrombocytosis. The anesthetic was definitely shown not to be a factor and hemorrhage was of little significance, if any. The author did not find any relation between this thrombocytosis and postoperative thrombosis, but whenever thrombosis did occur, the thrombocyte curve either remained stationary or dropped. This fact is regarded by the author as of diagnostic value for thrombosis. For the estimation of the thrombocytes, the author at first used Kristenson's method, which calls for veni puncture. Later he withdrew the blood from the finger tip, using the ordinary leukocyte counting pipet. The results checked very well. There was at most a difference in count of only 10,000.

Cause of Increased Venous Pressure in Pneumothorax.—Tsunoda reviews the possibilities of various factors which

might be responsible for the increased venous pressure consequent on artificially produced collapse of the lung but fails to expound any plausible theory which would be an adequate explanation. All he can say is that it does occur.

Hyperglycemia in Acute Pancreatitis.—Bernhard asserts that hyperglycemia is an important symptom of acute diseases of the pancreas. It is also sometimes present in empyema of the gallbladder and in gallstone disease, but when the sugar tolerance test is made, the patients in whom the pancreas is involved show a far greater increase in blood sugar than do those with gallbladder disease. Hence, the symptom has diagnostic value. As insulin deficiency is the cause of the hyperglycemia, insulin administration is indicated. The particular case of pancreatic disease studied was one of necrosis.

Cholemic Hemorrhages.—Soejima is convinced of the existence of a cholemic hemorrhagic diathesis and that it is not specific for icterus only, although it occurs most often in that disease (40 per cent). It also occurs in cases of latent icterus (38 per cent) and in nonicteric cases (13 per cent). Obstruction of the common bile duct by a malignant tumor furnishes the largest number of these cases because there is no tendency to healing and liver function becomes increasingly insufficient. In cases of icterus of long duration—when without apparent reason there occurs suddenly a gradual retrogression of the icterus—it sometimes happens that the blood coagulation is increased rather than diminished. The reason is that the bile stasis has caused disturbance of liver function and a consequent lowering of bilirubin formation. Therefore, the author is of the opinion that icterus cannot be regarded as a factor in alterations of coagulation time. The two conditions do not run parallel in experimental work. Bile does check coagulation because of its antithrombin action. Bile has no effect on fibrinogen or calcium. Bile acid also checks coagulation, provided not less than 0.1 per cent is present in the blood. The author concludes that the cholemic hemorrhagic diathesis is caused not by icterus but by the functional disturbances in the liver.

Sphincteroplasty for Prolapse of Rectum.—Matti demonstrated experimentally on dogs that a rubber ring encircling the rectum remained in situ up to twenty-five months without causing any irritation and with maintenance of its elasticity. If placed higher than the pelvic colon, it rapidly led to the formation of an ileus. In twelve cases of prolapse of the rectum, Matti inserted a rubber ring and a cure resulted in from one to three and one-half months. A similarly good result was obtained in a 9 year old boy with incontinence of long standing. The ring has been embedded two years without producing any unfavorable reaction. These rings are made of pure rubber and sulphur. They must not contain any metals, as these always cause irritation. The ring is sufficiently elastic to close the lumen of the rectum and at the same time to be opened by the physiologic peristaltic waves of the bowel. The ring is inserted subcutaneously as a 4 to 5 mm. thick tube through two small skin incisions (the method was described in 1917) united by a tunnel made in the perianal fascia. The ends of the tube are united by silk sutures, thus converting it into a ring. It is not intended to construct the rectum but to increase the natural resistance of its walls.

Synovial Osteochondromatosis.—Böhm regards this as a definite clinical entity and reports one case in which the knee joint was affected. Trauma may be a cause, but it is not a factor in all cases. The diagnosis is easily made with the roentgen ray. The symptoms are usually pain and swelling, with symptoms like those of chronic arthritis in the more severe cases. The treatment is surgical and consists in radical removal of the foreign bodies. In advanced cases, synovectomy and even capsular resection may have to be considered.

Jahrbuch für Kinderheilkunde, Berlin

122: 1-126 (Nov.) 1928

*Bronchial Asthma in Infants and Children. K. Stolte.—p. 1.
Elimination of Ammonia in Breast-Fed Children. K. Klinke.—p. 46.
Calcium Soap Stools. A. Oelsner and K. Klinke.—p. 58.
*Diet for Children with Diabetes Mellitus. H. Hirsch-Kauffmann and E. Schädrich.—p. 74.
Callous Pericarditis with Resulting Stasis in Children. W. Lengsfeld.—p. 95.
Hemoptosis in Nontuberculous Children. A. Laband.—p. 111.
*Roentgen Therapy of Pylorospasm in Infants. C. Wiener.—p. 113.

Diagnosis of Bronchial Asthma in Infants and Children.—Contrary to the widespread opinion that typical bronchial asthma is not found in infants, Stolte demonstrates in a number of cases that the symptoms appearing in early childhood are identical with those observed in adults. The diagnosis is difficult since thorough investigations are still lacking; various authors, however, have reported cases of the same disease under different names according to the most outstanding feature of their particular case. On the whole, the symptoms described are the same: extreme dyspnea with unilateral or bilateral pulmonary emphysema; marked contraction of all of the accessory muscles of inspiration; inability to expire completely; cyanosis of the lips and nails; grayish pale complexion, and a restlessness in the beginning of the attack, equal to the jactitation of older children and adults. The attack is followed by a complete relaxation of the body in which the respiratory muscles alone work excessively. The lung is highly inflated and does not return to its normal condition. These typical signs of bronchial asthma may be observed even in very young babies (aged from 6 to 8 weeks); the disease is more dangerous in infants than it is in adults and resulted in death in most of the cases reported. The treatment is the same as for adults.

Value of Mixed Diet for Children with Diabetes Mellitus.—Hirsch-Kauffmann and Schädrich divide their reports into two periods: the preinsulin period and the present time, when insulin is universally used. After careful study in many cases, the authors affirm that now the diet should not be as restricted and monotonous as it has been. A mixed diet, combined with insulin, gives very good results: the glycosuria disappears soon, and the children develop normally, as a result of the excellent appetite caused by the variety of their food. Another great advantage of this "physiologic" diet is the small amount of insulin required in spite of the great amount of carbohydrates consumed.

Roentgen Therapy of Pylorospasm in Infants.—Wiener reports several cases of pylorospasm in infants in whom roentgen therapy was successful. The vomiting stopped after one or two applications of roentgen rays and the infants could be fed as before; the amelioration was immediate and durable.

Monatsschrift f. Geburtshülfe u. Gynäkologie, Berlin

80: 79-242 (Oct.) 1928

Value of Kielland Forceps. K. Schwenke.—p. 82.
Fertility and Declining Birth Rate in Europe. H. Albrecht.—p. 98.
Typing of Blood with Retroplacental and Umbilical Cord Blood. J. von Khreninger-Guggenberger.—p. 104.
Frequency and Methods of Inducing Therapeutic Abortion. J. Kallinikoff.—p. 109.
*Hemorrhage During Menopause. W. Benthin.—p. 117.
Transplantation of Animal Fascia in Treatment of Prolapse and Retroflexion of the Uterus. G. Schubert.—p. 140.
Tumor of Granulosa Cells in Ovary. A. Hörrmann.—p. 143.
*Splenic Irradiation in Combination with Roentgen Therapy of Gynecologic Diseases. G. H. Schneider.—p. 146.
Histology of Carcinoma After Roentgen Irradiation. R. Dyroff.—p. 153.
Effect of Roentgen Irradiation of Ovaries Before Pregnancy on Development of Children Born Subsequently. W. Schmitt.—p. 157.

Etiology and Pathology of Hemorrhage During Menopause.—Benthin states that carcinoma is not always the cause of hemorrhage during the menopause. Very often the hemorrhage is caused by a harmless polyp that can be removed by curettage; uterine apoplexy, also, might be the reason for the sudden bleeding.

Splenic Irradiation in Combination with Roentgen Therapy of Gynecologic Diseases.—In cases of myoma, carcinoma of the cervix uteri or hemorrhagic metropathy, Schneider states that roentgenologic irradiation will insure better results and be safer than surgical intervention if the splenic region is included in the field of irradiation. Amenorrhea will be established at once; hemorrhages will be checked. He gave a 30 per cent Holzknecht erythema dose over the splenic area and from two-thirds to three-fourths such a dose over the skin.

Münchener medizinische Wochenschrift, Munich

75: 2039-2086 (Nov. 30) 1928

Effects of Irradiation on Lipoids. H. Much.—p. 2039.
*New Method of Killing Bacteria in Infections of Biliary Tract, Especially in Cholangeitis, Cholecystitis and Bacterichalia. K. Beckmann.—p. 2042.
*Seasonal Fluctuations of Illnesses. R. Hopmann.—p. 2043.

New Apparatus for Setting Fractures by Means of Screw Traction. L. Böhler.—p. 2047.
Modification of Weber's Instrument for Determining Degree of Illumination in Factories. F. P. Leusden.—p. 2052.
*Treatment of Furuncle and Carbuncle. Heddaeus.—p. 2052.
Cause and Diagnostic Significance of Cancerous Cachexia. A. Krecke.—p. 2056.
Tuberculosis: Perifocal Infection in Children. Birk and Hager.—p. 2057.
Early Tuberculous Infiltration: A Medicolegal Case. Krutzsch.—p. 2061.
Structure and Development of Papillary Apical Leukoplakia of Cervix. H. Hinselmann.—p. 2063.

New Method of Killing Bacteria in Infections of Biliary Tract.—On the basis of the fact that chemicals are used to combat inflammation in the urinary tract, Beckmann thought that this method might be used to even better advantage in infections of the biliary tract. He observed the influence of sodium carbonate introduced intraduodenally in a number of patients who showed a positive bacteriolytic reaction. In some of the cases he administered 50 cc. of a 5 per cent solution of sodium carbonate three times a day through a duodenal tube. Later, in order to avoid the frequent passage of the duodenal tube, he gave the sodium carbonate in capsules thrice daily. Complications were not observed in either case. These treatments were applied in periods of from three to four days. He reports three cases of paratyphoid bacillus infections and four cases of cholangeitis or cholecystitis which showed favorable results following this treatment. On the basis of his observations he concludes that this method increases the alkaline reaction of the biliary tract and thereby kills the bacteria.

Seasonal Fluctuation of Illnesses.—Hopmann points out that the increase of certain sicknesses, especially during the winter and spring months, is a generally admitted fact. Statistics show that during the year there are two periods characterized by a large number of deaths; the one occurs in February and March and the other in August. The high mortality rate during August affects infants particularly; the main cause appears to be cholera infantum. This period also shows an increase in intestinal disorders in adults. Both phenomena are due to the fact that during the warm period foodstuffs easily spread the germs of infection. However, in recent years these intestinal disorders show a certain decrease, mainly as a result of better sanitation. An increase in measles, diphtheria and whooping cough is noticeable during the winter months. Erysipelas increases during the winter and spring months, while cases of tetanus are more numerous in the spring. Hopmann calls special attention to the fact that the frequent occurrence of these illnesses during the winter months might lead to the supposition that they are invariably subsequent phenomena of disorders due to exposure to cold. He asserts that this is not always the case. Catarrhal illnesses of the upper air passages, muscular rheumatism and tonsillitis are probably caused directly by colds. Croupous pneumonia frequently appears independently of colds. Scarlet fever, measles, mumps, tetanus and diphtheria follow the disorders due to exposure to cold after an interval of about a month. There are some ailments, however, that appear during the fall-spring period which seemingly have no connection with disorders due to colds. Gallstone disturbances and peptic ulcer are most frequently observed during November and April. Rickets usually appears in December and January, while tetanus is most commonly observed from January to April. Hay-fever is also a seasonal illness since it is caused by the pollen of certain plants. Skin diseases are numerous during the spring months and nervous disorders usually appear in May. Diseases of the heart and of the vessels probably depend on barometric variations, since fatalities from arteriosclerosis are most frequent when the barometer registers a low atmospheric pressure.

Treatment of Furuncle and Carbuncle.—Heddaeus asserts that furunculosis is not caused by a bad state of the blood. It is always caused by outward conditions and usually begins in an infected hair follicle. Though some individuals, diabetic patients, for instance, are more subject to this kind of infection, the immediate cause is external. To prove this statement he points out that, if an isolated furuncle is properly treated, the infection does not spread. Concerning the treatment of large carbuncles, he says that in recent years he has employed artificial light therapy with great success. After this treatment has been applied for several days a pull on the overlying skin will permit a free escape of the pus. Later the necrotic tissues can be extracted by means of small forceps. The advantage of this method over the older methods of excision is that the resulting scar is hardly noticeable and the pains diminish after the first irradiation. Heddaeus recommends this method also for the treatment of furuncles, especially those in the axilla and on the lips.

Wiener klinische Wochenschrift, Vienna

41: 1641-1672 (Nov. 29) 1928

Frequency of Cancer in Tyrol. G. B. Gruber.—p. 1641.
Technic of Nitrous Oxide-Oxygen Narcosis. E. Domanig.—p. 1644.
*Diagnosis and Treatment of Echinococcus Disease in Man. B. Peričić.—p. 1647.
Treatment of Malignant Diphtheria. J. Zikowsky.—p. 1651.
Varicose Ulcer. H. Fuhs.—p. 1653.
Nutritional Disturbances in Children. H. Lehndorff.—p. 1657.
Treatment of Placenta Praevia. J. Sahler.—p. 1659.

Diagnosis and Treatment of Echinococcus Disease in Man.—Peričić states that heretofore the diagnosis of echinococcus disease has been based on the existence of an elastic, fluctuating tumor and on the so-called hydatid thrill. Recently roentgenoscopy has proved of value in the diagnosis. Eosinophilia, Weinberg's complement fixation reaction, and the Casoni reaction have also proved to be of diagnostic value. The hydatid thrill is a positive symptom but it is observed in only a few cases. Eosinophilia is of value only in connection with other positive symptoms. Roentgenoscopy is especially valuable in cases of cysts of the liver and lung. Weinberg's complement fixation reaction was never used by the author. The Casoni reaction, however, was used in most cases and proved to be very valuable. The treatment of echinococcus disease varies according to the location and the nature of the cysts. The author believes that echinococcus cysts in the lungs should be left alone; operation should not be resorted to because it is more dangerous to life than the disease itself. Cysts on the chest wall, or those complicating pyothorax, should be treated surgically. As operations have a high percentage of fatalities the author advocates a return to the older method of puncturing the cyst without aspirating it, and then injecting a parasiticide. This treatment is indicated in the treatment of cysts with aseptic contents. Cysts furnishing a hydatid thrill and those that have refilled require operation.

Zentralblatt für Gynäkologie, Leipzig

52: 2865-2928 (Nov. 10) 1928

Kielland's Operation for Prolapse of Uterus. P. Hüssy.—p. 2870.
Roentgenologic Examination of Vagina in Vaginal Atresia. H. Levy.—p. 2875.
Surgical Treatment of Inflammatory Adnexal Tumors. G. Conrad.—p. 2877.
Endometrial Proliferation in Laparotomy Scar Following Pertubation. E. Haeusermann.—p. 2880.
Decapitation of Fetus. H. Sachs.—p. 2881.
*Ossification of Coccyx as Obstacle to Delivery. S. Heckscher.—p. 2886.

Ossification of Coccyx as Obstacle to Delivery.—Immobility of the coccyx, caused by its early ossification, may become a serious obstacle to delivery. In a case reported by Heckscher, it was necessary to resect most of the coccyx in order to complete the delivery.

52: 2993-3056 (Nov. 24) 1928

Diagnosis of Cancer on Cervix Uteri. J. Schiffmann.—p. 2995.
*Behavior of Pregnant Organism During Starvation. P. Jonen.—p. 2999.
Transverse Position as an Indication for Cesarean Section. M. Rosenstein.—p. 3002.
Abdominal Pregnancy in Lesser Pelvis. W. Pahl.—p. 3005.
*Ectopic Pregnancy: 150 Cases. E. Bamberger.—p. 3009.
Mechanic Ileus Three Years After a Doléris' Ventrifixation. E. von Konrád.—p. 3014.
Traumatic Hematoma of Vulva. M. Wachtel.—p. 3019.
Indications for Manual Separation of Placenta and Placental Adhesions. L. Lind.—p. 3022.

Experimental Investigations on Behavior of Pregnant Organism During Starvation.—Jonen states that it is generally assumed that the fetus develops like a parasite, taking from the maternal organism all essential substances needed for its growth and development, without regard for the mother. To determine the correctness of this statement he performed experiments on four dogs. Three of the animals were pregnant; the fourth, the control animal, was not. He describes their reactions during a period of starvation. The experiment showed that the control animal had greater capacity for resistance than the pregnant animals. Of the three pregnant ani-

mals two aborted before they became moribund. The fetus of the third one was backward in development; later this animal also aborted. The author believes that the experiments prove that in case the mother's food supply is not sufficient for the proper development of the fetus, the maternal organism does not sacrifice all its vitality but rather abortion occurs. On the basis of his observations, Jonen concludes that the generally accepted theory is substantiated only to a certain degree.

Ectopic Pregnancy: One Hundred and Fifty Cases.—Bamberger calls attention to the fact that statistics reveal a marked increase in ectopic pregnancy. He suggests as a probable cause the fact that in recent years there has been a considerable increase in abortions and in the use of contraceptives. These are generally considered to be the chief etiologic factors in extra-uterine pregnancies. Bamberger analyzes 150 cases. Concerning the operation he says that the pregnant tube should always be extirpated, and in many cases it is advisable to remove both tubes. When the patient is weakened through excessive bleedings, the blood from the abdominal cavity should be conserved. After it has been strained, it is diluted with a sodium citrate solution, oxygen is passed through it and then it is injected into the vein of the arm. This infusion was applied in thirty-four cases and always with good results.

Irkutsky Meditsinsky Jurnal, Irkutsk

6: 1-162 (Oct.) 1928

Psychic Changes in Epidemic Encephalitis in Early Childhood. V. S. Deriabin.—p. 5.
Blood Sugar in Different Periods of Pregnancy. A. G. Boutylin.—p. 11.
Case of Distoma Hepaticum. F. Talysin and S. Tikachinskaya.—p. 41.
*Treatment of Anthrax. P. J. Kaminer.—p. 45.
Cysts of Appendix. N. S. Epifanov.—p. 49.
Mixed Tuberculous and Syphilitic Infection. I. N. Perevodchikov.—p. 57.
Influence of Mountain Climate on Erythrocytes. M. F. Shostakovsky.—p. 67.
Morphology and Physiology of Human Embryo of One Month. V. S. Bourov.—p. 71.
Dangers in C al Surgery. S. N. Broner-Levenson.—p. 105.
Endocarditis Lenta. A. T. Nodov.—p. 141.

Treatment of Anthrax.—Kaminer emphasizes the good results of conservative local treatment in all forms of anthrax, especially in purely local skin anthrax, without pronounced constitutional symptoms. Eight cases of local skin anthrax were cured by him with borated petrolatum dressings, rest and diet.

Klinicheskaya Meditsina, Moscow

6: 1447-1508 (Nov.) 1928

Septic Infection in Female Genitalia. N. M. Kakushkin.—p. 1447.
Physical Therapy. N. M. Rudnitsky.—p. 1456.
Epidemic of Scarlet Fever. F. D. Ramianzer and V. I. Sheinkman.—p. 1462.
Prophylactic Vaccination in Scarlet Fever. T. V. Alengovich-Grakov.—p. 1470.
Antitoxic Serum in Scarlet Fever. N. P. Savvatimska and V. A. Krestovnikova.—p. 1481.
Diet in Scarlet Fever. A. G. Shapiro.—p. 1489.
*Serotherapy in Scarlet Fever. V. F. Shubert.—p. 1492.
Eruption in Measles. E. I. Lazinik.—p. 1495.
Action of Antityphoid Vaccination on Latent Tuberculosis. Lokshin.—p. 1500.
Leukocyte Count in Prediction of Hemorrhages. L. I. Gefter.—p. 1504.
Etiology of Rickets and Malaria. A. A. Kiel.—p. 1506.

Serotherapy in Scarlet Fever.—From his clinical experience with eighty-four patients treated with antitoxic serum, Shubert concludes that the serum used in the first days of the disease has an abortive action on the clinical course although it does not prevent the development of complications.

Nederlandsch Tijdschrift v. Geneeskunde, Haarlem

72: 5761-5884 (Nov. 24) 1928

Chronic Ulcerous Pyodermia. T. M. van Leeuwen.—p. 5765.
Hyperesthesia of the Skin in Patients with Internal Diseases. W. A. Boekelman.—p. 5772.
*Course of Strabismus and Amblyopia in Twins. P. J. Waardenburg.—p. 5783.
Besredka's Reaction. G. J. Huët.—p. 5799.

Course of Strabismus and Amblyopia in Twins.—From studies of instances of strabismus in uniovular and biovular twins, Waardenburg concludes that inheritance of the condition rests on the joint action of inherited factors, some of which are in all probability of a recessive nature. He reports a case of convergent strabismus and amblyopia in uniovular twin boys. In one the amblyopia was in the right, in the other, in the left eye. The boys are now 16 years old. Spontaneous cure of the strabismus has taken place. The degree to which the amblyopia has improved differs widely, however, in the two boys. At the beginning the refractive power was about the same in the four eyes. It increased in all four eyes, but not evenly. At the end of nine years the anisometropia was 1.75 diopters in one boy, and 2.5 diopters in the other.

Ugeskrift for Læger, Copenhagen

90: 1151-1172 (Dec. 13) 1928

*Syphilis and Surgery. V. Meisen.—p. 1151.
*Naso-Ocular Reflex and Diagnostic Significance. T. B. Wernøe.—p. 1154.
Calcaneous Gout. E. de Fine Licht.—p. 1158.
International Society of Medical Hydrology. A. Faber.—p. 1159.

Syphilis and Surgery.—Meisen advises the surgeon always to consider the possibility of syphilis before making his diagnosis, even when the case appears to be a purely surgical disorder, and calls attention to the clinical forms of syphilis which may resemble surgical conditions. He reports thirteen cases, mostly personal. In four instances unnecessary operations were performed (two of a mutilating nature) because of a wrong diagnosis, in one case histologic, and in three cases clinical. In some cases proper treatment was greatly delayed because the possibility of syphilitic disease was not considered. He finds the greatest difficulty to be the clinical differential diagnosis between syphilis and malignant tumors.

Naso-Ocular Reflex and Diagnostic Significance.—Wernøe says that the naso-ocular nasodilatory reflex passes to the central nervous system through the sensory trigeminus tracts and then through the sympathetic tracts to the sensory end-organs of the eye, which constitute the starting point for the vasodilatory axon reflex. As a rule bilateral eye symptoms follow unilateral nasal irritation; if eye symptoms do not occur, and irritation of the opposite side of the nose causes bilateral eye symptoms, a peripheral trigeminus anesthesia is indicated. If nasal irritation causes only a crossed effect, disease of the efferent tracts of the reflex must be assumed. If, in spite of normal sensibility, bilateral nasal irritation causes no reflex, organic bulbar disease must be considered as highly probable. If the reflex is preserved in spite of marked nasal anesthesia, it is due to supranuclear changes. Unilateral total nasal anesthesia with preserved naso-ocular reflex points strongly to a functional disease. In patients with naso-ocular reflex of uncrossed type, cranial asymmetry is often found. Conversely, disease of the sympathetic is suggested when unilateral cranial dystrophic diseases occur in patients with naso-ocular reflex of marked uncrossed type.

Upsala Läkareförenings Förhandlingar, Uppsala

34: 681-772 (Nov. 30) 1928

*How Are Errors in Determination of Blood Group to Be Avoided? E. D. Schött.—p. 681.
*Contribution to Roentgen Diagnosis of Fatty Tumors Difficult to Identify Clinically. H. Laurell.—p. 693.
Some Feminine Names in History of Obstetrics. J. Olow.—p. 709.
Investigations on Motility of Surviving Intestine at Fever Temperatures. B. Hamne.—p. 731.
Anatomy of Auriculoventricular Bundle. B. Wahlin.—p. 769.

How Are Errors in Determination of Blood Group to Be Avoided, Especially When Haste Is Necessary?—Schött determines both receptors and agglutinins, a procedure which, he says, affords a valuable control, since the two tests must give the same blood group. In blood transfusion, receptors and agglutinins should be determined in both donor and recipient. He considers it unjustifiable to propose the use of universal donors without examination of the individual with regard to receptors and agglutinins. The standard method of quick determination of the blood group is described, and also the method for determination of the blood group when test serum and test blood corpuscles are not available.

Contribution to Roentgen Diagnosis of Fatty Tumors, Especially Lipomas, Difficult to Identify Clinically.—Laurell asserts that tumors that are difficult to diagnose clinically, especially the subfascial lipomas, can often be diagnosed by roentgen examination. Four personally observed cases of fatty tumors are described. Because of their relatively low power of absorption for roentgen rays, corresponding on the whole to the absorption capacity of normal fatty tissues, these tumors often appear as negative shadows.